Vol. 938 Number 4

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 23, 1975

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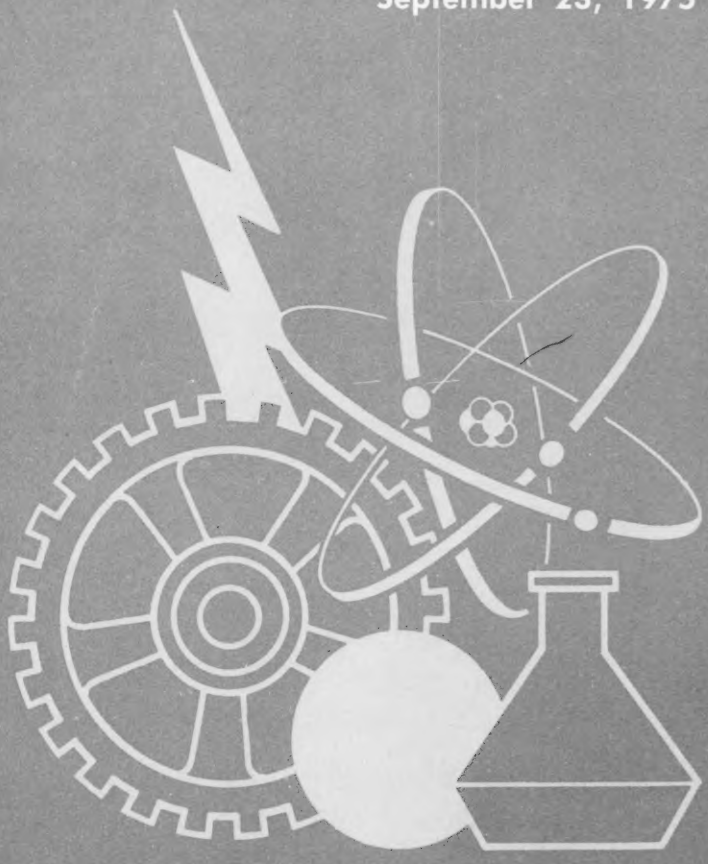

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

September 23, 1975 Volume 938 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,611,813, T. Sharpless and E. S. Eichert, Jr., MAGNETIC DATA STORAGE SYSTEM, **filed** Sept. 19, 1966, D.C. Md. (Baltimore), Doc. 17653–C, *Technitrol, Inc.* v. *Control Data Corporation.* Decision, ordered that final judgment is hereby entered that claims in suit are invalid, plaintiff's complaint dismissed with prejudice, defendant's "First Counterclaim" dismissed as moot, June 2, 1975.

2,897,641, Simon and Thomas, PACKAGING METHODS, **filed** May 30, 1975, D.C. Conn. (Bridgeport), Doc. B–75–175, *Instapak Corporation* v. *Jeffrey C. Widen et al.*

2,904,709, M. E. Lautner, ELECTRIC MOTORS, **filed** June 2, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1776, *MSL Industries, Inc.* v. *Airtrol Corp. and Barber-Colman Company.*

2,908,511, G. L. Rogers, COUPLER ASSEMBLY; **3,544,257,** B. C. Cranage, COUPLER ASSEMBLY, **filed** Apr. 6, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c870, *Stile-Craft Manufacturers, Inc.* v. *Airco, Inc., doing business as Ohio Medical Products.* Stipulated dismissal that civil action shall be dismissed without prejudice, May 28, 1975.

2,962,844, Orlando and Schub, MACHINE FOR MAKING DRY CELLS, **filed** May 9, 1975, D.C. Del. (Wilmington), Doc. 75–128, *Acme Battery Corp.* v. *ESB Incorporated.*

3,007,487, K. Adams, VALVE; **3,442,488,** same, **filed** Aug. 6, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1953, *Valve and Primer Corporation* v. *Gebruder Adams and Karl Adams.* Enter order, stipulation permitting defendant to file an order against plaintiff in accordance with stipulated final judgment and Writ of Permanent Injunction granted, June 29, 1973.

3,028,538, Rosenfeld and Kupferberg, REGULATED OUTPUT VOLTAGE POWER SUPPLY; **3,243,690,** J. R. GATLEY, VOLTAGE REGULATED POWER SUPPLY WITH ADJUSTABLE CURRENT LIMIT; **3,305,763,** Kupferberg and Ash, VOLTAGE/CURRENT REGULATED POWER SUPPLIES, **filed** Apr. 28, 1975, D.C., First Circuit, Massachusetts (Boston), Doc. 75–1151, *Forbro Design Corp.* v. *Raytheon Company.* **Same, filed** Apr. 28, 1975, D.C., First Circuit, Massachusetts (Boston), Doc. 75–1152, *Forbro Design Corp.* v. *Raytheon Company.*

3,056,066, J. J. Dozier, Jr., IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES, **filed** May 29, 1975, D.C. (District of Columbia), Doc. 75–0877, *James J. Dozier* v. *AMC.*

3,065,759, F. Lewis, HAIR STRAIGHTENING METHOD AND APPARATUS, **filed** May 27, 1975, D.C., S.D.N.Y., Doc. 75–C–2477, *Frederick Lewis and Lewis-Parham Corporation* v. *Clairol Inc.*

3,241,408, L. D. McCauley, VEHICLE WHEEL NUT OR BOLT, **filed** June 5, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75–1894–MML, *Stallion Enterprises Inc.* v. *McGard Inc.*

3,243,690. (See 3,028,538.)

3,305,763. (See 3,028,538.)

3,379,889, Barnett and Barnett, BEAM-DRIVEN GYROSCOPE DEVICE, **filed** Apr. 30, 1975, United States Court of Claims (District of Columbia), Doc. 145–75, *Eugene R. Barnett and Willard L. Barnett* v. *The United States.*

3,421,731, Koch and Rocher, HOT TOP MAINTAINING SYSTEM, **filed** June 7, 1975, D.C., W.D. Pa. (Pittsburgh), Doc. 73–471 C.A., *Metallurgical Exoproducts Corporation* v. *Pittsburgh Metals Purifying Company Inc.* Judgment is entered in favor of defendant, May 30, 1975.

3,422,189, J. A. Rider, METHOD AND COMPOSITIONS FOR THE TREATMENT OF GASTRO-INTESTINAL DISORDERS, **filed** Dec. 12, 1974, U.S. Court of Appeals (District of Columbia), Doc. 74–1141–42, *Atlas Chemical Industries, Inc.* v. *Moraine Products.* Judgment of the District Court is affirmed as to the invalidity of the patent, Dec. 12, 1974.

3,442,488. (See 3,007,487.)

3,451,944, H. E. Finch, RICE HULL METHOD, APPARATUS AND PRODUCT, **filed** June 2, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–1096 RFP, *Norman Pitt et al.* v. *Richard Redlick and Harvey E. Finch.*

3,510,004, J. Hoeltzenbein, ARTIFICIAL KIDNEY, **filed** Aug. 17, 1972, D.C. Del. (Wilmington), Doc. 4450, *Extracorporeal Medical Specialties Inc.* v. *Baxter Laboratories Inc.* Stipulation to dismiss, it is hereby stipulated by and between the parties and subject to the approval of this court, that the complaint, counterclaim, amended counterclaim and reply thereto, each be dismissed without prejudice, June 6, 1975.

3,544,257. (See 2,908,511.)

3,563,134, H. B. Rodstein, AIR OPERATED TOOL, **filed** Mar. 8, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–531–DWW, *Mayview Corp.* v. *Harvey B. Rodstein, Rodac Pneumatic Tools Inc. and Rodac International Corp.* Final judgment and order that patent is invalid and has not been infringed upon by plaintiff, May 16, 1975.

3,608,117, Abildgaard, Groswith III and Travaglio, MACHINE FOR BINDING AND PUNCHING SHEETS; **3,756,625,** Abildgaard and Groswith III, METHOD AND APPARATUS FOR BINDING BOOKS; **3,811,146,** Abildgaard, Groswith III, DeMan and Buan, MACHINE FOR BINDING BOOKS; **D. 227,195,** Abildgaard, Groswith III, Johnson and Estes, same, **filed** May 8, 1975, D.C., N.D. Calif. (San Francisco), Doc. C75–0911–RFP, *Velo-Bind, Inc.* v. *Minnesota Mining & Mfg. Co. et al.*

3,713,490, B. R. Watson, METHOD AND APPARATUS FOR SPOTTING FLUID DOWNHOLE IN A BOREHOLE; **3,802,507,** same, APPARATUS FOR SPOTTING FLUID DOWNHOLE IN A BOREHOLE, **filed** May 29, 1975, D.C., N.D. Tex. (Lubbock), Doc. CA–5–75–46, *Watson Packer, Inc.* v. *Dresser Industries, Inc.*

3,714,865, J. A. Villano, APPARATUS FOR MILLING CAMS AND THE LIKE, AS FOR SWISS-TYPE SCREW MACHINE CAMS; **2,831,487,** same, METHOD FOR MILLING CAMS FOR SWISS-TYPE SCREW MACHINES, **filed** June 2, 1975, D.C. Conn. (New Haven), Doc. N–75–148, *John A. Villano, doing business as Cam-A-Ton, Inc.* v. *Burndy Corporation and The Berco Manufacturing Co.*

3,724,258, Hofstede and Logman, APPARATUS FOR BENDING ELONGATE OBJECTS, **filed** June 10, 1975, D.C. Minn. (Duluth), Doc. C–5–75–56, *Vekamaf Holland, B.V. et al.* v. *Pipe Benders, Inc. et al.*

3,756,625. (See 3,608,117.)

3,802,507. (See 3,713,490.)

3,811,146. (See 3,608,117.)

3,821,519, W. J. PIETENPOL, CARD RETURN MECHANISM, **filed** June 6, 1975, D.C., C.D. Calif. (San Diego), Doc. CV75–1912–MML, *Bell & Howell Company* v. *Audiotronics Corporation.*

3,831,487. (See 3,714,865.)

3,835,292, Walter, Kronheim, and Levine, STEAM CURLING IRON, **filed** June 12, 1975, D.C., S.D.N.Y., Doc. 75–C–2831, *Clairol Incorporated* v. *Scovill Manufacturing Company.*

3,853,048, G. Collins, SHELLER DEVICE FOR PEAS AND THE LIKE, **filed** June 5, 1975, D.C., N.D. Ala. (Birmingham), Doc. 75–L–0719–S, *Jo Collins, doing business as Lady Jo Manufacturing Company* v. *Hold'Em, Inc., Mr. Charles Bottcher and "A" through "Z," etc.*

3,853,168, W. A. Wrono, ROLL-UP SHADE CONSTRUCTION AND METHOD OF ERECTING SAME, **filed** June 5, 1975, D.C., S.D. Fla. (Fort Lauderdale), Doc. (FL)75–243–C–WM, *Wrono Enterprise Corporation* v. *Sandor-Tapco, Incorporated.*

3,853,222, J. D. HELMS, PRESSURIZATION APPARATUS, **filed** May 15, 1975, D.C., S.D.N.Y., Doc. 75–C–2303, *Rebound Systems, Inc.* v. *Matchpoint Industries, Inc.*

D. 219,118, Baker and Plescia, BOAT; **D. 227,708,** same; **D. 229,103,** Baker, Plescia and Ferguson, BOAT UPPER SHELL; **D. 229,194,** same, **filed** May 30, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75–301, *Sidewinder Marine, Inc., Shasta Fibre Glass Corp. and Saul Davidson* v. *Sidewinder of Wisconsin, Inc., Thompson Boat Co. and Paul Padek.*

D. 227,195. (See 3,608,117.)

D. 227,708. (See D. 219,118.)

D. 229,103. (See D. 219,118).

Certificates of Correction for the Week of Sept. 23, 1975

Re. 28,381	3,845,078	3,871,974	3,881,668
D. 234,929	3,851,156	3,872,176	3,882,076
3,305,922	3,852,082	3,872,598	3,882,381
3,614,741	3,852,204	3,872,963	3,882,588
3,640,392	3,853,843	3,873,751	3,882,838
3,644,567	3,853,886	3,873,975	3,883,283
3,667,218	3,853,893	3,874,029	3,883,538
3,766,061	3,854,851	3,874,487	3,883,922
3,767,905	3,855,071	3,874,727	3,884,083
3,769,242	3,855,233	3,874,889	3,884,136
3,769,336	3,855,579	3,874,946	3,885,018
3,770,777	3,856,930	3,875,286	3,885,034
3,783,477	3,856,977	3,875,880	3,885,040
3,785,202	3,859,437	3,876,424	3,885,561
3,794,998	3,859,621	3,877,273	3,886,026
3,799,648	3,860,069	3,877,695	3,886,134
3,805,834	3,860,801	3,878,049	3,886,154
3,809,729	3,861,017	3,878,110	3,887,155
3,813,619	3,862,074	3,878,225	3,887,387
3,814,540	3,862,199	3,878,332	3,887,664
3,815,170	3,866,507	3,878,335	3,888,103
3,815,490	3,868,404	3,878,854	3,888,667
3,822,215	3,869,719	3,879,091	3,888,974
3,824,219	3,870,397	3,879,753	3,889,811
3,824,757	3,870,404	3,880,350	3,890,105
3,827,113	3,870,515	3,880,515	3,890,611
3,828,542	3,870,540	3,880,536	3,890,620
3,830,653	3,870,731	3,880,750	3,891,656
3,831,017	3,870,762	3,880,913	3,891,720
3,833,688	3,870,821	3,881,034	3,891,750
3,839,341	3,870,822	3,881,082	3,892,613
3,839,342			
3,844,761			

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the licensing policy of each agency-sponsor.

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Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF AGRICULTURE

Chief, Research Agreements and Patent Mgmt Branch
General Services Division,
Hyattsville, Md. 20782

Patent 3,607,356. Imparting Flame Resistance to Fibrous Textiles From an Alkaline Medium. Filed Oct. 4, 1968. Patented Sept. 21, 1971. Not available NTIS.

Patent 3,787,457. Vinyl Chloride Plastic Compositions and Certain Plasticizers Therefor. Filed Sept. 13, 1972. Patented Jan. 22, 1974. Not available NTIS.

Patent 3,801,525. Epithioamides as Plasticizer-Stabilizers. Filed Aug. 31, 1971. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,803,303. Polymeric Compositions for Attracting Cotton Boll Weevils. Filed Jan. 27, 1972. Patented Apr. 9, 1974. Not available NTIS.

Patent 3,807,946. Process for Preparing Durable Press Fabrics Which Can be Dyed With Acid Dyes. Filed Jan. 24, 1972. Patented Apr. 30, 1974. Not available NTIS.

Patent 3,813,443. Boll Weevil Sex Attractant. Filed Apr. 27, 1972. Patented May 28, 1974. Not available NTIS.

Patent 3,827,858. Durable-Press Cotton Textiles and Method of Making Same. Filed Apr. 27, 1972. Patented Aug. 6, 1974. Not available NTIS.

Patent 3,829,290. Reaction of Sodium Cellulosate With Mono- and Difunctional Epoxides in Non-Aqueous Media. Filed June 29, 1972. Patented Aug. 13, 1974. Not available NTIS.

Patent 3,832,461. Method for Disrupting Pheromone Communication With Cis-7-Dodecenl-1-ol. Filed Mar. 15, 1972. Patented Aug. 27, 1974. Not available NTIS.

Patent 3,835,638. Process for Producing Core Yarn. Filed Mar. 15, 1972. Patented Sept. 17, 1974. Not available NTIS.

Patent 3,839,823. Method of Chemically Inducing Lightwood Formation in Pine Trees. Filed Sept. 7, 1973. Patented Oct. 8, 1974. Not available NTIS.

Patent 3,845,107. Phosphinidynetrimethanol Triacetate. Filed Mar. 2, 1972. Patented Oct. 29, 1974. Not available NTIS.

Patent 3,849,067. Process for the Mercerization of Cotton Fabrics With Liquid Ammonia and Ammonia/Amine Solutions. Filed May 7, 1971. Patented Nov. 19, 1974. Not available NTIS.

Patent 3,853,459. Process for Dyeing Crosslinked Cellulosic Fabrics With Disperse Dyestuffs. Filed Nov. 5, 1971. Patented Dec. 10, 1974. Not available NTIS.

Patent 3,854,866. Recurable Crosslinked Cellulose Fabrics From Methylol Reagents and Polycarboxylic Acids and Method of Making. Filed Oct. 16, 1972. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,856,700. Precursor Compositions From Animal Hide Glues for Dry-Structured Foams. Filed Dec. 4, 1972. Patented Dec. 24, 1974. Not available NTIS.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,853,507. Cold Trap Unit. Filed Dec. 31, 1947. Patented Dec. 10, 1974. Not available NTIS.

Patent 3,859,422. Method for Reproducibly Controlling the Crystallinity of Synthetic Graphite. Filed Oct. 16, 1972. Patented Jan. 7, 1975. Not available NTIS.

Patent 3,859,808. Cold Trap for Purging Air From a Gas Diffusion System. Filed Apr. 5, 1946. Patented Jan. 14, 1975. Not available NTIS.

Patent 3,860,515. Method for Concentrating Macromolecules. Filed Oct. 31, 1973. Patented Jan. 14. 1975. Not available NTIS.

DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th & C Streets, NW.,
Washington, D.C. 20240

Patent application 616,441. Reverse Osmosis Process Using Crosslinked Aromatic Polyamide Membranes. Filed Feb. 13, 1967. PC $3.25/MF $2.25.

DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research,
Arlington, Va. 22217

Patent application 415,900. Intrusion Detector. Filed Nov. 14, 1973. PC $3.25/MF $2.25.

Patent application 429,306. Novel Prostaglandin Derivatives. Certain in Vivo and in Vitro Effects Thereof and Processes for the Preparation of Same. Filed Dec. 28, 1974. PC $3.75/MF $2.25.

Patent application 440,215. Analog to Digital Conversion by Charge Transfer Device. Filed Feb. 6, 1974. PC $3.75/MF $2.25.

Patent application 452,156. Production of Beryllium Reinforced Composite Solid and Hollow Shafting. Filed Mar. 18, 1974. PC $3.25/MF $2.25.

Patent application 452,312. Inflatable Ice Igloo. Filed Mar. 18, 1974. PC $3.25/MF $2.25.

Patent application 453,740. Wrap-Around Fin. Filed Mar. 22, 1974. PC $3.25/MF $2.25.

Patent application 458,610. An Optical System for 360 Degree Annular Image Transfer. Filed Apr. 8, 1974. PC $3.25/MF $2.25.

Patent application 480,905. Underwater Teletype Communication System. Filed June 19, 1974. PC $3.25/MF $2.25.

Patent application 481,574. Submersible Visual Simulator for Remotely Piloted Systems. Filed June 21, 1974. PC $3.25/MF $2.25.

Patent application 482,117. Sonic Decompression. Filed June 24, 1974. PC $3.25/MF $2.25.

Patent application 487,115. Ultra High Frequency Impedance Adjustment Means. Filed July 10, 1974. PC $3.25/MF $2.25.

Patent application 490,819. Direct Fire Weapon Simulator System. Filed July 22, 1974. PC $3.25/MF $2.25.

Patent application 495,705. Wound Covering and Method of Application. Filed Aug. 8, 1974. PC $3.25/MF $2.25.

Patent application 496,598. Post Detection Device for Eliminating Backscatter. Filed Aug. 12, 1974. PC $3.25/MF $2.25.

Patent application 496,599. Correction of Spatial Nonuniformities in Sonar, Radar, and Holographic Acoustic Imaging Systems. Filed Aug. 12, 1974. PC $3.25/MF $2.25.

Patent application 497,017. Improved Method of and Apparatus for Preventing Compressor Stall in a Gas Turbine Engine. Filed Aug. 13, 1974. PC $3.25/MF $2.25.

Patent application 499,249. Doppler Velocity/Altimeter Radar Set. Filed Aug. 21, 1974. PC $3.25/MF $2.25.

Patent application 501,544. Apparatus for Performing a Discrete Cosine Transform of an Input Signal. Filed Aug. 29, 1974. PC $3.75/MF $2.25.

Patent application 505,448. Rear-Screen Wide-Angle On-Axis Projection System. Filed Sept. 13, 1974. PC $3.25/MF $2.25.

Patent application 507,825. Wearable Sound Attenuating Enclosure. Filed Sept. 20, 1974. PC $3.25/MF $2.25.

Patent application 508,925. Improved Towable VLF Sonar Projector. Filed Sept. 25, 1974. PC $3.25/MF $2.25.

Patent application 514,335. Accelerometer Tilt Error Compensator. Filed Oct. 15, 1974. PC $3.25/MF $2.25.

Patent application 514,540. Sound Absorbing Material. Filed Oct 15, 1974. PC $3.25/MF $2.25.

Patent application 538,634. Frequency-Sensitive Attenuator. Filed Jan. 3, 1975. PC $3.25/MF $2.25.

Patent application 543,594. Color Panoramic Laser Projector. Filed Jan. 23, 1975. PC $3.25/MF $2.25.

Patent application 543,709. Method of and Means for Launching and Reaching a Strictly Waterborne Surface Effect Ship. Filed Jan. 24, 1975. PC $3.25/MF $2.25.

Patent application 549,395. Solid State Switches. Filed Feb. 12, 1975. PC $3.25/MF $2.25.

Patent application 550,067. Fluid for Filling Sonar Transducers. Filed Feb. 14, 1975. PC $3.25/MF $2.25.

Patent application 553,208. Circulation Controlled Rotary Wing Aircraft and Control System Therefor. Filed Feb. 26, 1975. PC $3.25/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 555,641. Improved Method of Detecting and Counting Bacteria. Filed Mar. 5, 1975. PC $3.25/MF $2.25.

Patent application 557,430. Method and System for in Vivo Measurement of Bone Tissue. Filed Mar. 11, 1975. PC $3.25/MF $2.25.

Patent application 558,600. Window Defect Planar Mapping Technique. Filed Mar. 14, 1975. PC $3.25/MF $2.25.

Patent application 560,891. Nonequilibrium Radiation Nuclear Reactor. Filed Mar. 21, 1975. PC $3.25/MF $2.25.

Patent application 563,050. Fabrication of Hollow Elastomeric Bodies. Filed Mar. 28, 1975. PC $3.25/MF $2.25.

Patent application 563,283. Samplex of Gas Borne Particles. Filed Mar. 28, 1975. PC $3.25/MF $2.25.

Patent application 565,162. Method and Apparatus for Providing a Servodrive Signal in a High Speed Stepping Interferometer. Filed Apr. 4, 1975. PC $3.75/MF $2.25.

Patent 3,874,677. High Speed, Self-Acting Shaft Seal. Patented Apr 1, 1975. Not available NTIS.

Patent 3,875,332. Digital Transmitter for Data Bus Communications System. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,875,500. Pseudo-Noise Test Set for Communication System Evaluation. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,875,584. Television Noise Reduction Device. Patented Apr. 1, 1975. Not available NTIS.

U.S. DEPT. OF AGRICULTURE

Chief, Research Agreements and Patent Mgmt. Branch,
Federal Bldg., General Services Division, Agricultural
Research Service, Hyattsville, Md. 20782

Patent application 484,198. Automatic Produce-Bagging Machine That Uses Factory-Roll Polyethylene Net Tubing. Filed June 28, 1974. PC $3.25/MF $2.25.

Patent application 484,199. Spreader Mandral for Automatic Produce-Bagging Machine That Uses Factory-Roll Polyethylene Net Tubing. Filed June 28, 1974. PC $3.25/MF $2.25.

Patent 3,787,456. Vinyl Chloride Plastic Compositions and Certain Plasticizers Therefor. Filed Jan. 22, 1974. Not available NTIS.

Patent 3,839,823. Method of Chemically Inducing Lightwood Formation in Pine Trees. Filed Sept. 7, 1973. Patented Oct. 8, 1974. Not available NTIS.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 517,662. Method for Testing Wire Rope. Filed Oct. 24, 1974. PC $3.25/MF $2.25.

Patent 3,859,807. Cold Trap System for Recovering Condensable Gas From a Vessel to be Evacuated. Filed Aug. 26, 1947. Patented Jan. 14, 1975. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building
Bethesda, Md. 20014

Patent application 563,466. Method of Making Pteridine Compounds. Filed Mar. 31, 1975. PC $4.25/MF $2.25.

Patent application 567,719. Fast Charge Digitizer and Digital Data Acquisition System for Measuring Time Varying Radiation Fields. Filed Apr. 14, 1975. PC $3.75/MF $2.25.

Patent 3,882,949. Universal Wheelchair for the Severely Disabled. Filed Nov. 16, 1972. Patented May 13, 1975. Not available NTIS.

DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 420,836. High Load, Quick-Disconnect Link. Filed Dec. 3, 1973. PC $3.25/MF $2.25.

Patent application 441,081. High-Speed Sampler With Variable Sample Rate. Filed Feb. 11, 1975. PC $3.25/MF $2.25.

Patent application 458,156. Water Level Gauge. Filed Apr. 5, 1974. PC $3.25/MF $2.25.

Patent application 459,143. Wide Angle Single Channel Projection Apparatus. Filed Apr. 8, 1974. PC $3.25/MF $2.25.

Patent application 470,415. Multi-Wavelength Display System. Filed May 16, 1974. PC $3.25/MF $2.25.

Patent application 470,416. Laser Type Weapon Fire Simulation System. Filed May 16, 1974. PC $3.25/MF $2.25.

Patent application 472,560. Variable-Impedance Delay Line Correlator. Filed May 23, 1974. PC $3.25/MF $2.25.

Patent application 476,355. A Bridge-Type Electrohydraulic Actuator. Filed June 5, 1974. PC $3.25/MF $2.25.

Patent application 518,000. Simulator Including Improved Holographic Heads up Display System. Filed Oct. 25, 1974. PC $3.25/MF $2.25.

Patent application 548,300. Apparatus for the Generation of a Two Dimensional Discrete Fourier Transform. Filed Feb. 10, 1975. PC $3.75/MF $2.25.

Patent application 562,294. Injection Locked Josephson Oscillator Systems. Filed Mar. 26, 1975. PC $3.25/MF $2.25.

Patent application 563,907. Solid State Electronically Rotatable Raster Scan for Television Cameras. Filed Mar. 31, 1975. PC $3.25/MF $2.25.

Patent application 570,123. Rollonet Assembly. Filed Apr. 18, 1975. PC $3.25/MF $2.25.

Patent application 572,589. A Laser With a High Frequency Rate of Modulation. Filed Apr. 28, 1975, PC $3.25/MF $2.25.

Patent application 574,129. Solid State Power Controller. Filed May 2, 1975. PC $3.25/MF $2.25.

Patent application 574,216. Two Dimensional Array Antenna. Filed May 5, 1975. PC $3.25/MF $2.25.

Patent application 575,769. Tunable Electroabsorptive Detector. Filed May 8, 1975. PC $3.25/MF $2.25.

Patent 3,867,715. Underwater Communications System. Filed Nov. 8, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,872,293. Multi-Dimensional Fourier Transform Optical Processor. Filed July 20, 1973. Patented Mar. 18, 1975. Not available NTIS.

Patent 3,876,943. Impulse Noise Reduction Circuit. Filed Feb. 18, 1960. Patented Apr. 8, 1975. Not available NTIS.

DEPARTMENT OF THE AIR FORCE
AF/JACP
Washington, D.C. 20314

Patent application 563,009. Method and Apparatus for Improving the Slowly Moving Target Detection Capability of an AMTI Synthetic Aperture Radar. Filed Mar. 27, 1975. PC $3.25/MF $2.25.

Patent 3,874,266. Weapon Dispersal System. Filed Jan. 14, 1974. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,874,957. Use of 1,1′-bis-(1-Glycidoxylalkyl) Ferrocenes in Rocket Propellants. Filed Apr. 7, 1970. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,876,614. Thermally Stable, Highly Fused Quinoxaline Composition and Method of Synthesis. Filed Apr. 17, 1974. Patented Apr. 8, 1975. Not available NTIS.

Patent 3,877,014. Wide Scan Angle Antenna Utilizing Surface Wave and Multiple Element Array Modes of Operation. Filed Nov. 14, 1973. Patented Apr. 8, 1975. Not available NTIS.

Patent 3,877,030. Multiport Multimode Slot Antenna. Filed Aug. 1, 1973. Patented Apr. 8, 1975. Not available NTIS.

Patent 3,878,704. Method of Forming Fragmentation Wrap for Explosive Weapons. Filed June 25, 1973. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,878,791. Encapsulated Pellet Igniter Charge. Filed Jan. 17, 1969. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,879,228. Photo-Regenerative Electrochemical Energy Converter. Filed Mar. 6, 1972. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,879,244. Method of Making High Modulus Graphite Fiber Reinforced Tubes. Filed Apr. 18, 1973. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,879,682. Electronic Tuning System for High Power Cavity Oscillators. Filed June 12, 1974. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,879,686. Laser System for Producing Variable Duration Short Pulses. Filed Sept. 20, 1973. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,879,731. Impedance Load for Radar Target Cross Section Control Element. Filed Nov. 22, 1971. Patented Apr. 22, 1975. Not available NTIS.

Patent 3,879,916. Fatigue Resistant Spanwise Splice. Filed July 22, 1974. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,880,527. Annular Beam Radial Scanner. Filed Sept. 23, 1971. Patented Apr. 29, 1975. Not available NTIS.

Patent 3,880,638. Thermal Tempering of Non-Oxide Glass Compositions. Filed Dec. 21, 1973. Patented Apr. 29, 1975. Not available NTIS.

U.S. DEPT. OF AGRICULTURE
Chief, Research Agreements and Patent, Mgmt. Branch,
Federal Bldg., General Services Division
Agricultural Research Service
Hyattsville, Md. 20782

Patent application 476,191. Air Jet Nozzle Assembly for a Green Boll Separating and/or Classifying Machine. Filed June 4, 1974. PC $3.75/MF $2.25.

Patent application 476,235. Removal of Green Bolls and Heavy Materials From Seed Cotton by Air Jets. Filed June 4, 1974. PC $3.25/MF $2.25.

Patent application 476,240. Air Jet Conveyor Accelerator for a Green Boll Separating and Classifying Machine. Filed June 4, 1974. PC $3.25/MF $2.25.

Patent application 506,932. Apparatus and System for Mixing Pesticide With Water Concurrently With Spraying. Filed Sept. 17, 1974. PC $3.25/MF $2.25.

Patent application 519,727. Pollen Trap With Cleaning Grid. Filed Oct. 31, 1974. PC $3.25/MF $2.25.

Patent application 525,129. Fluid Impact Gin. Filed Nov. 19, 1974. PC $3.25/MF $2.25.

Patent 3,830,436. Hammer Mill With Integral Subsampling Portion. Filed Aug. 9, 1973. Patented Aug. 20, 1974. Not available NTIS.

Patent 3,849,104. Control of Aeschynomene SP. With Colletrotrichum Gloeosporioides Penz. F. Sp. Aeschynomene. Filed Apr. 17, 1973. Patented Nov. 19, 1974. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health
Chief, Patent Branch, Westwood Building
Bethesda, Md. 20014

Patent application 563,513. Density Gradient Fractionation by Piston Displacement. Filed Mar. 31, 1975. PC $3.25/MF $2.25.

DEPARTMENT OF THE NAVY
Assistant Chief for Patents
Office of Naval Research, Code 302
Arlington, Va. 22217

Patent application 518,539. Tubular Mercury Graphite Electrode. Filed Oct. 29, 1974. PC $3.75/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 566,493. Solar Powered Pump. Filed Apr. 9, 1975. PC $3.25/MF $2.25.

Patent application 571,458. Photovoltaic Cell Array. Filed Apr. 25, 1975. PC $3.25/MF $2.25.

Patent application 571,821. A Device for Installing Rocket Engines. Filed Apr. 25, 1975. PC $3.25/MF $2.25.

Patent application 572,990. Motion Restraining Device. Filed Apr. 30, 1975. PC $3.25/MF $2.25.

Patent application 574,208. Stirling Cycle Engine and Refrigeration Systems. Filed May 5, 1975. PC $3.25/MF $2.25.

Patent application 574,218. Myocardium Wall Thickness Transducer. Filed May 5, 1975. PC $3.25/MF $2.25.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 30, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-27-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-18-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-17-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-4-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-2-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-23-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-10-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-6-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-27-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-22-75

Expiration of patents: The patents within the range of numbers indicated below expire during September 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,849,714 to 2,854,668 inclusive
Plant Patents..... Numbers 1,746 to 1,757 inclusive

REISSUES

SEPTEMBER 23, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,556

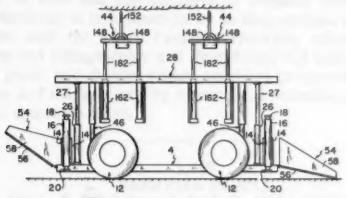
MULTI-PURPOSE VEHICLE FOR USE UNDERGROUND

Jon R. Swoager, Imperial, Pa., assignor to Automation Equipment, Inc., Imperial, Pa.

Original No. 3,811,290, dated May 21, 1974, Ser. No. 299,354, Oct. 20, 1972. Continuation-in-part of Ser. No. 241,975, April 7, 1972, Pat. No. 3,793,966. Application for reissue Nov. 19, 1974, Ser. No. 525,223

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—63 **4 Claims**



1. A self-propelled vehicle for use in underground excavations having a floor and a ceiling, said vehicle comprising:

a frame;

wheel assemblies supporting said frame, said wheel assemblies being independently suspended and steerable;

a body supported on said frame;

first lifting means supporting by said frame for raising said body above said frame;

a plurality of rotatable chuck assemblies disposed within said body and adapted to engage a workpiece for insertion into said ceiling;

second lifting means supported by said body and engaging said chuck assemblies for raising said chuck assemblies above said body; and

means mounted on said frame for contacting said ceiling above said vehicle and said floor below to support said ceiling against collapse.

Re. 28,557

DISC DISPENSING APPARATUS

John Gordon Williams, 74 Ravenhill Rd., Fforestfach, Swansea, and Peter John Griffiths, 2 Castle St., Skewen, Neath, Glamorgan, both of Wales

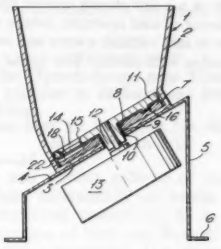
Original No. 3,783,885, dated Jan. 8, 1974, Ser. No. 266,648, June 27, 1972. Application for reissue Apr. 17, 1974, Ser. No. 461,807

Claims priority, application United Kingdom, June 30, 1971, 30732/71; Nov. 27, 1971, 55148/71

Int. Cl. G07d *1/00*

U.S. Cl. 133—5 **16 Claims**

1. Apparatus for dispensing discs, for example coins, the apparatus comprising upper and lower relatively rotatable plates the upper plate having a disc receiving hole positioned to receive a disc to be dispensed, the lower plate having a disc supporting surface and a disc receiving recess disposed below such disc supporting surface, said recess communicating with the exterior of the plates, the upper plate having disc ejecting means to engage a disc in said recess and to drive such disc from the recess, the arrangement being such that the hole in the upper plate can receive a disc which is supported from below by said disc supporting surface of the lower plate, the disc riding on the said disc supporting surface during continued relative rotation of the plates until the disc is in alignment with, and drops into the disc receiving recess from which it is



ejected by the disc ejecting means during further relative rotation of the plates.

Re. 28,558

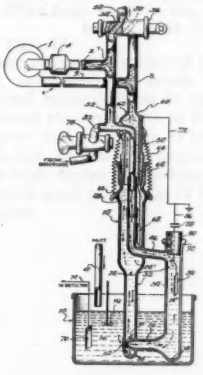
SELF-CLEANING APERTURE TUBE FOR COULTER STUDY APPARATUS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Original No. 3,746,976, dated July 17, 1973, Ser. No. 131,923, Apr. 7, 1971. Application for reissue June 10, 1974, Ser. No. 477,760

Int. Cl.[2] G01N *27/00*

U.S. Cl. 324—71 CP **14 Claims**



1. In a particle measuring apparatus including a container of particulate liquid suspension to be tested, an aperture tube extending into said container, a vacuum source for moving the liquid from the container into and through the aperture tube,

a first electrode in the container and a second electrode in the aperture tube to establish an electrical field between said container and the aperture tube, and a detector, the aperture tube having a first and a second chamber, the first chamber having an aperture in communication with the liquid suspension in the container, said second chamber having an orifice provided therein at a point closely spaced from and directly opposite the interior of said aperture, means connecting said second chamber to said vacuum source and means to initially fill the first chamber with particle free liquid and the second chamber with the liquid suspension, the improvement comprising, a conduit extending between said chambers to provide a closed path for liquid flow therebetween, a pump interposed in said conduit to create liquid flow about said path, and a filter member in said conduit, whereby the suspension will flow from the container through the aperture and the orifice into said second chamber to mix with the liquid already therein and circulate about said path, said filter member removing the particles from the liquid before the same is returned to the first chamber.

PLANT PATENTS

GRANTED SEPTEMBER 23, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,786
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Aug. 19, 1974, Ser. No. 498,867
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of begonia characterized particularly as to uniqueness by its deep orange/red flower color, with the tepals having a sparkling velvety lustre; plum red foliage color and deep blood red color of both the plant and flower stems; excellent propagation habit from leaf cuttings, and by its excellent potential as an outdoor specimen plant.

3,787
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Aug. 19, 1974, Ser. No. 498,868
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant characterized particularly as to uniqueness by its light pink flower color, relatively short growth habit, relatively fast rooting habit, and by its improved characteristics of adventitious bud initiation.

3,788
ROSE PLANT
Anthony Perry, Garden Grove, Calif., assignor to Henry A. Conklin, McFarland, Calif.
Filed Mar. 28, 1973, Ser. No. 345,694
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extraordinarily vigorous and large habit of growth, a habit of usually bearing flowers singly on long stems, with fewer prickles than the average red hybrid tea rose varieties, exceptionally large flower size, good flower petalage, with the individual petals being very large and broad, regular arrangement of the petals in the open flowers, with a high degree of imbrication, a distinctive and attractive medium red general color tonality of the flowers, said flowers having a white vegetative streak on the midrib of some of the inner petals, and a distinctive and strong flower fragrance characterized by a blend of tea and damask.

3,789
ROSE PLANT
Reimer Kordes, Sparrieshoop, near Elmshorn, Holstein, Germany, assignor to Jackson and Perkins Company, Medford, Oreg.
Filed Sept. 18, 1974, Ser. No. 506,996
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—25 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of buds and flowers being of similar hue to the cultivar Prominent, U.S. Plant Pat. No. 3,380, but of a lighter shade, a compact, well branched plant, glossy leaves, the leaflets being proportionately more narrow than those of Prominent, a high degree of resistance to rose powdery mildew, and very little fragrance.

3,790
ROSE PLANT
Reimer Kordes, Sparrieshoop, near Elmshorn, Holstein, Germany, assignor to Jackson and Perkins Company, Medford, Oreg.
Filed Sept. 18, 1974, Ser. No. 507,252
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—24 **1 Claim**

1. A new and improved rose plant of the floribunda class substantially as illustrated and described, and characterized particularly by its vigorous growth with heavy, strong stems similar to those of the cultivar Mabella, with buds near those of Minigold, but of a deeper yellow color and fewer petals, with flowers having petals of stiff, heavy substance and borne in large clusters on terminals of main basal branches, but generally singly on lateral branches, and little fragrance.

3,791
ROSE PLANT
William A. Warriner, Tustin, Calif., assignor to Jackson and Perkins Company, Medford, Oreg.
Filed Sept. 23, 1974, Ser. No. 508,699
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by its vigorous well branched plant habit, by its formation of large buds of Buttercup Yellow opening to large blooms of Lemon Yellow having little or no fragrance, large semi-glossy foliage, a high degree of resistance to powdery mildew, and relatively good production of blooms when grown in a greenhouse.

PATENTS

GRANTED SEPTEMBER 23, 1975

ERRATA

For CLASS	See PATENT NO.
228–118	3,906,617
228–118	3,906,618
082–079	3,906,821
092–168	3,906,845
138–155	3,907,049
138–157	3,907,050
131–017 R	3,907,321
208–354	3,907,388
404–056	3,907,443
423–563	3,907,500
432–235	3,907,965
357–024	3,908,182
357–065	3,908,183
357–072	3,908,184
357–074	3,908,185
357–080	3,908,186
357–081	3,908,187
357–082	3,908,188

PATENTS

GRANTED SEPTEMBER 23, 1975

GENERAL AND MECHANICAL

3,906,546

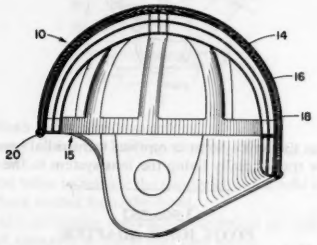
HAND GUN BULLET PROOF PROTECTIVE HEADGEAR

Elwyn R. Gooding, 120 Darwin Rd., Pinckney, Mich. 48169

Filed Apr. 16, 1973, Ser. No. 351,657

Int. Cl.[2] F41H *1/04*; **A42B** *3/00*

U.S. Cl. 2—3 R **5 Claims**



1. A protective headgear assembly comprising a rigid outer shell, a liner positioned within said outer shell in surface-to-surface engagement therewith, said liner being comprised of a plurality of independent layers of cloth material that are independently yieldable and movable inwardly in said assembly so that said layers can function in successive manner to retard movement of a bullet fired through said outer shell, a sub-liner positioned within said liner and in an inwardly spaced position from said outer shell, said inner liner being comprised of a closed cell foam material shaped to correspond generally to the shape of said outer shell, said outer shell, said liner and said sub-liner being movable relative to each other in response to an impact blow to said outer shell to thereby distribute and absorb the force from the blow, and a yieldable crown disposed in supporting engagement with said sub-liner shaped to fit on the head of a wearer of said assembly.

3,906,547

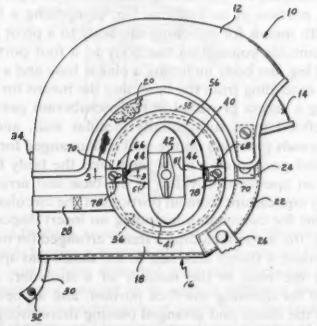
HEADSET RETAINER FOR HELMET

Jackson A. Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Filed Sept. 26, 1974, Ser. No. 509,667

Int. Cl.[2] A42B *3/00*

U.S. Cl. 2—6 **15 Claims**



1. A helmet and earphone assembly including in combination, a flexible relatively close fitting helmet, means forming an ear opening in said helmet, a relatively rigid frame, means mounting said frame in said ear opening, an earcup assembly, and manually operable readily releasable means for locking said earcup in assembled relationship with same frame.

3,906,548

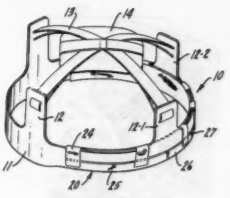
SWEAT BAND FOR A HARD HAT SUSPENSION UNIT

Bert J. Kallis, Chicago, Ill., assignor to Bert J. Kallis, Chicago, Ill.

Filed Oct. 24, 1974, Ser. No. 517,416

Int. Cl.[2] A42C *5/02*

U.S. Cl. 2—181.4 **8 Claims**



1. In a hard ha[t] having a non-absorbent band with opposed edges which encompasses the head of the wearer and in which the band has spaced upright spikes which anchor a suspension harness comprising straps attached to a center crown pad: a liner of absorbent material comprising a strip lining the inside of the band and of a length to span the forehead of the wearer, said strip haaving on one edge a plurality of spaced elongated extensions foldable over one edge of the band, said strip having on the other edge a plurality of tabs foldable over the other edge of the band to meet the folded extensions, and said extensions and said tabs having opposable pressure actuatable adhering elements at the free ends thereof selected from the group consisting of pressure actuatable adhesive and pressure actuatable hooked fabric.

3,906,549

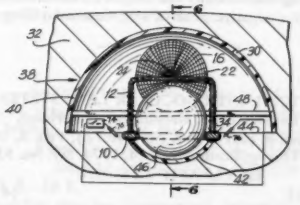
IMPLANTING STRUCTURE AND METHOD

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Continuation-in-part of Ser. No. 425,805, Dec. 18, 1973, abandoned, and a continuation-in-part of Ser. No. 298,024, Oct. 16, 1972, Pat. No. 3,826,241. This application July 17, 1974, Ser. No. 489,444

Int. Cl.[2] A61F *1/22*, *1/24*; **A61B** *19/00*

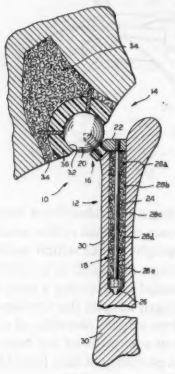
U.S. Cl. 3—1.5 **23 Claims**



14. A device for forming an implant which will include living tissue, comprising a structure having the general outline of the implant and provided with an exterior surface on which tissue will grow, and mounting means for mounting said structure in a body cavity with only a predetermined feeding part

of said structure connected to body tissue while said mounting means maintains the remainder of the structure spaced from the body tissue.

3,906,550
PROSTHETIC DEVICE HAVING A POROUS FIBER METAL STRUCTURE
William Rostoker, 2052 W. 108th Pl., Chicago, Ill. 60643, and Jorge Galante, One Brighton Ln., Oakbrook, Ill. 60521
Filed Dec. 27, 1973, Ser. No. 428,763
Int. Cl.[2] A61F *1/24*; A61C *13/30*
U.S. Cl. 3—1.912 **10 Claims**

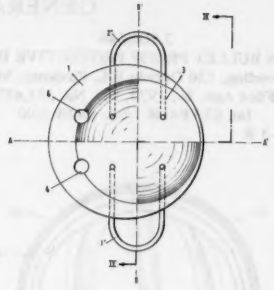


1. A prosthetic device for incorporation into the skeletal structure of a human or animal including:

a porous fiber metal structure formed from a plurality of substantially, sinusoidally shaped fiber strands, each of said fibers having a ratio of amplitude to period of substantially 0.24 or greater, said strands being metallurgically bonded to each other at their points of contact, said fiber metal structure providing at least a portion of the surface of said prosthetic device adjacent said skeletal structure to enable bone and soft tissue growth into said metal structure, said period being substantially the length of a cycle of said sinusoidal fiber strand and said amplitude being substantially the height/2 between a positive peak and a negative peak of said sinusoidal fiber strand.

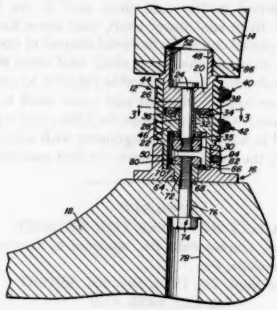
3,906,551
ARTIFICIAL INTRA-OCULAR LENS SYSTEM
Klaas Otter, Heresingel 28, Groningen, Netherlands
Continuation-in-part of Ser. No. 440,728, Feb. 8, 1974, abandoned. This application Nov. 14, 1974, Ser. No. 523,897
Int. Cl.[2] A61F *1/16*, *1/24*
U.S. Cl. 3—13 **14 Claims**

1. An artificial intra-ocular lens system, comprising an optical portion and a lens support portion including first lens support means to be positioned posterior to the iris and second lens support means to be positioned anterior to the iris, said first and second lens support means cooperating to prevent displacement of the lens system through the pupillary aperture, said second lens support means including a haptic rim connected to and contiguous with at least a major portion of the circumference of the optical portion of the lens system,



and in that the lens system comprises transiridial lens-fixation means for transiridially fixing the lens system in the eye.

3,906,552
PIVOT JOINT ADAPTER
Albert L. Weber, Appleton, N.Y., assignor to Lloyd J. Watkins, Lockport, N.Y., a part interest
Continuation-in-part of Ser. No. 284,974, Aug. 30, 1972, Pat. No. 3,842,443. This application Apr. 4, 1974, Ser. No. 458,046
Int. Cl.[2] A61F *1/04*, *1/08*
U.S. Cl. 3—30 **7 Claims**



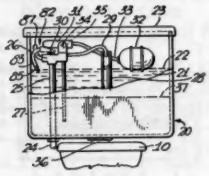
1. An adapter for permitting attachment of a pivot joint to the foot portion of an artificial leg, comprising a body provided with means for attaching the body to a pivot joint, and with means for connecting the body to a foot portion of an artificial leg, the body including a planar base and a protuberant part extending from the base, and the means for attaching including a recess provided in the protuberant part and partially defined by a substantially circular wall, and internal screw threads provided on the wall and arranged for receiving a threaded portion of a pivot joint, and the body further including an aperture provided in the base and arranged substantially equidistant from all portions of the circular wall, and the means for connecting including an insert disposed in the aperture, the insert including a shank arranged for mating with the aperture, a flange attached to the shank and arranged for abutting the base in the manner of a shoulder, the shank arranged for abutting the foot portion, and an opening provided in the shank and arranged passing therethrough, retaining means including internal screw threads for threadingly engaging with the screw threads of a bolt arranged passing through the foot portion and securing the foot portion to the adaptor.

3,906,553

REMOTELY CONTROLLED WATER LEVEL CONTROL MEANS FOR FLUSH TOILETS

Stanley E. Johnson, 1529 Weyburn St., Ottawa, Ontario, Canada

Filed Mar. 15, 1974, Ser. No. 451,544
Int. Cl.[2] E03D 5/12
U.S. Cl. 4—67 A 8 Claims



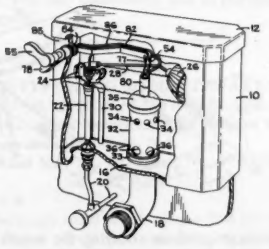
1. A flush toilet comprising:
a. a water closet for holding a supply of water;
b. a bowl;
c. a first valve to release the supply of water held in the tank to flush wastes from the bowl;
d. a valve actuating mechanism mounted on said tank and hand operable to open said first valve;
e. a float controlled valve for controlling water supplied to the water closet; and
f. a manually operable valve adjusting mechanism selectively varying the effective shut-off position of the float controlled valve to vary the quantity of water supplied to the tank for use in a subsequent flushing operation, said valve adjusting mechanism having a hand operable member movably mounted on said water closet, a further member movably mounted on said float controlled valve to variously adjust the effective shut-off position of the same, and linkage means interconnecting said hand operable member and said further member whereby said latter member is moved in response to movement of the hand operable member.

3,906,554

SELECTIVE TOILET FLUSHING ARRANGEMENT

Arthur L. Johnson, 4921 Third St., San Francisco, Calif. 94124

Filed Dec. 12, 1974, Ser. No. 531,858
Int. Cl.[2] A61B 19/00; E03D 1/34, 5/02
U.S. Cl. 4—67 A 8 Claims



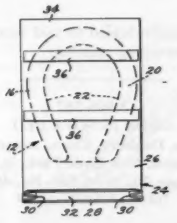
1. A dual flushing arrangement for water toilets comprising a water tank having a bottom and provided in said bottom a discharge port, a tube mounted over said discharge port and having openings provided in its wall at different levels vertically thereof for the admission of water from the tank into the interior of the tube and hence through said discharge port into the toilet bowl, plural opening-blocking means selectively movable from a first position wherein they block the flow of water through the openings at said different levels into a second position wherein they unblock said openings, said opening-blocking means having central openings to establish communication between said water tank and said discharge port, and means exteriorly of said tank selectively operable to selectively move one or the other of said opening-blocking means individually from said first to said second position.

3,906,555

DISPOSABLE LINER

Nathaniel C. Scott, and James N. Scott, both of P.O. Box E, La Conner, Wash. 98257

Filed Sept. 11, 1972, Ser. No. 287,704
Int. Cl.[2] A61G 9/00
U.S. Cl. 4—112 6 Claims



1. A disposable liner for use with a receptacle for body wastes, the receptacle having a bottom and side walls defining a cavity partly overlaid by a peripheral ledge portion forming a seat about a top opening comprising:
an open-mouthed bag of moisture-proof pliable sheet material, said bag being large enough to loosely receive the receptacle and to have a side portion of the bag pushed through the opening in the receptacle and generally conformed to the cavity therein for reception of body wastes, the mouth of said bag being large enough to be turned back over the receptacle and to turn the bag inside-out to capture the wastes and then have the mouth sealed to facilitate transportation to disposal without spillage or escape of odors; and
deformable means secured to said bag, insertable through the receptacle top opening, and engageable beneath the receptacle ledge portion at at least opposite sides of the opening to retain said bag side portion in general conformance with the receptacle cavity while enabling said bag when inside-out to be readily detached from the receptacle, said deformable means including a plurality of spaced strips of material stiffer than that of said bag extending across the exterior of said bag side portion and having their end portions adapted to engage beneath the ledge portion and their central portions adapted to hold said bag side portion against the receptacle bottom.

3,906,556

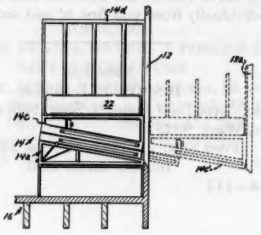
SAFETY SLEEPING ARRANGEMENT

Stanley A. Schenk, 2030 Koring Rd., Evansville, Ind. 47712, and William S. Bugg, Rt. No. 1, Box 29, Reed, Ky. 42451

Filed Mar. 18, 1974, Ser. No. 452,057
Int. Cl.[2] A47C 19/06; A47D 7/04
U.S. Cl. 5—10 R 3 Claims

1. A safety sleeping arrangement comprising a framework having a fixed portion disposed within an enclosure, a movable portion slidable on said fixed portion from a first position within said enclosure to a second position extending from said enclosure, and means retaining said movable portion of said framework on said fixed portion at said first position including a flammable element selectively interlocking a pivotal arm

and a stopping member, said movable portion normally bearing against said stopping member of said retaining means at



said first position and released to said second position upon movement of said stopping member.

3,906,557

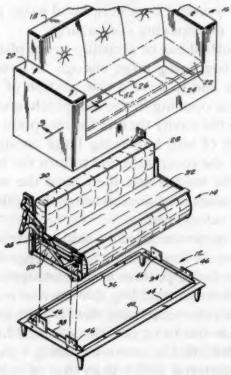
DROP IN SOFA BED

Andrew A. Barabas, Danbury, Conn., assignor to Castro Convertible Corporation, New Hyde Park, N.Y.

Filed June 20, 1974, Ser. No. 481,441

Int. Cl.[2] A47C *17/14*

U.S. Cl. 5—13 **6 Claims**



1. A convertible sofa bed comprising an independent peripheral base frame being generally rectangular in plan and having a peripheral outwardly extending unobstructed horizontal support surface formed thereon, a folding sofa bed mechanism mounted on said base, and a separate and independent upholstered sofa frame removably mounted on said base frame independently of said sofa bed mechanism, said sofa frame having an interior generally rectangular support frame which is complementary to said base frame and which has a peripheral bottom surface engaged with and supported on said unobstructed horizontal support surface, whereby said sofa frame is removable from said base frame while the sofa mechanism remains on the base frame available for operation; said folding bed mechanism being folded substantially entirely within the confines of said base frame to leave said outwardly extending support surface exposed and unobstructed for engagement with said support frame.

3,906,558

PIECE OF FURNITURE FOR SITTING AND LYING

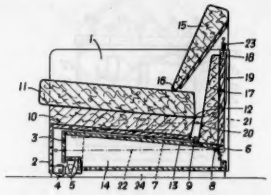
Alfred Alembik, Anastasius-Grungasse 37/9, Vienna 18, Austria

Filed May 29, 1974, Ser. No. 474,160

Claims priority, application Austria, June 18, 1973, 5336/73

Int. Cl.[2] A47C *17/40*

U.S. Cl. 5—29 **17 Claims**



1. A piece of furniture which is convertible between a sitting position and a lying position, comprising;

a frame,

a carriage which is adapted to be moved out of and into said frame for the conversion of the piece of furniture between said positions,

first and second cushions resting on said carriage one behind the other in said lying position and one over the other in said sitting position,

a back cushion fixedly connected to said frame and defining a recess therewith, and

a wedge-shaped cushion connected to said carriage and displaceable thereby between a stowed-away position behind said back cushion in said recess when said piece of furniture is in said still position and a position for use in which it succeeds and adjoins said first and second cushions lying one behind the other on the carriage in said lying position, and

guide means on said frame for imparting a sliding and pivotal movement into said wedge-shaped cushion between said stowed-away position and said position for use.

3,906,559

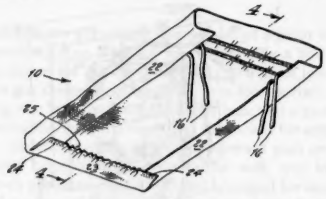
BLANKET AND SHEET

Agnes K. Bahr, 707 Whispering Pine Dr., Auburndale, Fla. 33823

Filed Apr. 15, 1974, Ser. No. 460,735

Int. Cl.[2] A47G *9/00*

U.S. Cl. 5—334 C **1 Claim**



1. In a blanket or sheet covering for a crib or bed, the combination of a rectangular flexible fabric material having a first elastic tape stitched along a central portion of one end edge of said material, and a pair of second and third elastic tapes stitched completely across and in spaced away relation along and opposite end edge of said material, opposite side edges of said material being each folded over two parallel, spaced apart fold lines, and the first said end edge is likewise folded over two parallel spaced apart fold lines, so to form a peripheral panel on each said side edge and the first said end edge which are stitched together at their corners, thus forming

a pocket on one end of said material, and into which one end of a mattress can be fitted, the said pair of elastic tapes at the other end of said material each including a freely extending end portion adaptable to extend around a bottom of said mattress, and said free end portions on one side being adaptable to be tied to said free portions on the other side.

3,906,560

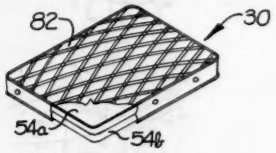
SPRING CUSHION CONSTRUCTION AND METHOD OF FORMING SAME

Carl Gordon Bulloch, Jr., 31 Kingwood Pl., Asheville, N.C. 28804

Continuation-in-part of Ser. No. 298,953, Oct. 19, 1972, Pat. No. 3,818,560, which is a division of Ser. No. 130,328, April 1, 1971, Pat. No. 3,719,963. This application June 12, 1974, Ser. No. 478,618

Int. Cl.² A47C *23/00, 27/22*

U.S. Cl. 5—354 **15 Claims**



1. A spring cushion construction for use as a seat, mattress or the like and comprising

a foamed cellular elastomeric pad comprising a generally flat outer surface, and an inner surface including a generally flat central portion and a depending edge extending about at least a substantial portion of the periphery of said central portion, said central portion of said inner surface including a dense outer crust of substantial toughness,

a spring assembly disposed immediately below said central portion of said inner surface and including a terminal face portion contacting said outer crust to thereby support said elastomeric pad and with said outer crust serving as an insulator to prevent said terminal face portion from penetrating into the interior of said elastomeric pad during use, said spring assembly having an overall configuration generally conforming to that of said central portion so as to be confiningly received within the bounds of said depending edge and wherein said edge serves to prevent lateral shifting between said spring assembly and pad, and means for maintaining said spring assembly in assembled relation with said elastomeric pad to prevent the separation thereof.

3,906,561

PLIERS-TYPE HAND TOOL WITH ATTACHED INSULATION SLITTING BLADE

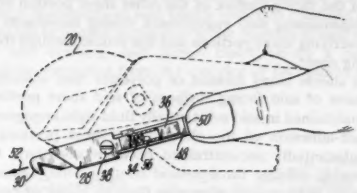
Jaspal S. Bawa, South Plainfield, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

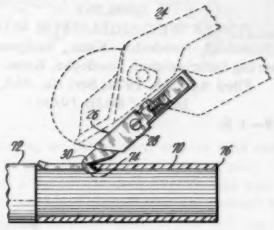
Filed May 22, 1974, Ser. No. 472,108

Int. Cl.² B25B *7/22*

U.S. Cl. 7—5.4 **12 Claims**

1. In a pliers-type hand tool having a first jaw means and a second jaw means pivotally coupled to one another, handle means extending rearwardly from each of said first and second jaw means for moving said jaw means, and blade means coupled to a selective one of said first and second jaw means and having a sharpened first end movable from a first position located within the periphery of said selective one of said first and said second jaw means to a second position located beyond the periphery of said selective one of said first and said second jaw means for engagement with the insulation of an insulated conductor, the improvement comprising: said blade means being located on an exterior surface of said selective one of said first and said second jaw means, said blade means first end being slidably extendable along an axis generally coincident with the longitudinal axis of said tool and forwardly of the bight formed by the closure of said first and said second jaw means; said blade means first end being hook-shaped for





insertion between the insulation and the conductive portion of an insulated conductor cover means disposed over at least said first end of said blade means and coupled to said selective one of said first and said second jaw means; and means cooperative with said blade means for biasing said blade means in said first position.

3,906,562

HEAT TREATING APPARATUS AND PROCESS

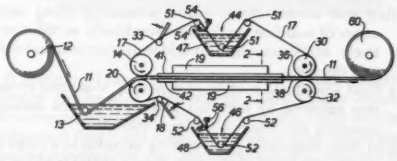
Ian Bruce Angliss, Belmont, and Geoffrey Bruce Guise, Highton, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jan. 26, 1973, Ser. No. 326,776

Claims priority, application Australia, Feb. 3, 1972, 7851/72

Int. Cl.² D06B *3/02*

U.S. Cl. 8—149.1 **15 Claims**



1. A method of dyeing an article comprising the steps of applying dye to the article and subsequently fixing the dye by heat treatment comprising the steps of:

a. locating the article between facing surfaces of overlying portions of a pair of flexible imperforate sheets,

b. moving said sheet portions together with the article as a unit through a heating zone,

c. maintaining parts of the said facing surface of one of said sheet portions to each lateral side of the article in substantially fluid-tight engagement with corresponding parts of the facing surface of the other sheet portion and,

d. maintaining said engagement during movement of the overlying sheet portions and the article through the heating zone;

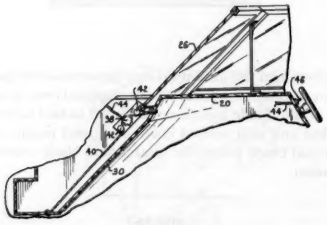
said sheets being formed of polyester film whereby said parts of said facing surfaces of said sheet portions are maintained in said substantially fluid-tight engagement by self-adhesion of the sheets; said sheet portions being substantially unconstrained between said parts thereof during passage through said heating zone, against outward deformation otherwise than by virtue of resilience of that sheet portion.

3,906,563

POWER WINDSHIELD FOR BOATS

Dan E. Bramhall, Neodesha, Kans., assignor to Fiberglass Engineering Incorporated, Neodesha, Kans.

Filed Apr. 25, 1974, Ser. No. 464,250
Int. Cl.² B63B *19/00*
U.S. Cl. 9—1 R **3 Claims**



1. A boat comprising:

a hull having a stern and a bow, the bow having a covered portion defining a deck;

first and second spaced apart windshield sections mounted on said deck at an acute angle to a vertical plane passing through the keel of the boat;

a well compartment located beneath the deck immediately in front of said windshield sections,

there being an opening into said compartment in the deck at the area between said windshield sections;

first and second track means extending along adjacent edges of said first and second windshield sections respectively, and extending into said well compartment through said opening;

a third windshield section of generally V-shaped cross section received by said first and second track means and spanning the distance between the latter,

said third windshield section being movable in a plane intersecting the plane of the deck from a raised position above said deck wherein said first, second and third sections cooperate to present a generally V-shaped boat windshield, along said track means and into said compartment beneath said deck to present an entryway onto the deck from a location aft of said bow; and

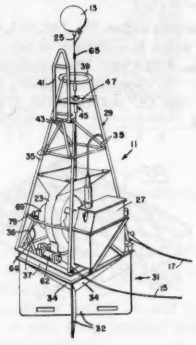
means for moving said third windshield section between said lowered and raised positions and for holding said third section in any location intermediate said lowered and raised positions.

3,906,564

REMOTELY CONTROLLED UNDERWATER INSTRUMENT SYSTEM

Clifford T. Thompson, Tracyton, and Dennis J. Schwab, Bremerton, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1972, Ser. No. 315,390
Int. Cl.² B63B *21/52*
U.S. Cl. 9—8 R **3 Claims**



1. A winch system comprising:

a. an elongated upwardly extending rigid structure having one end mounted on a base member and the other end for supporting a buoyant object;

b. drive means for withdrawing or releasing said buoyant object;

c. said drive means being mounted on said one end of said elongated rigid structure;

d. said base member includes a plurality of downwardly extending blades;

e. adjacent blades of said plurality of downwardly extending blades being positioned at about right angles with respect to each other;

f. a plurality of angularly positioned plates are each positioned between adjacent downwardly extending blades; whereby

g. lowering said winch system onto a soft surface results in said plurality of downwardly extending blades cutting downward through said soft surface and said angularly positioned plates being forced against said soft surface.

3. A winch system comprising:

a. an elongated rigid structure having one end mounted on a base member and the other end for supporting a buoyant object;

b. drive means including a support cable for withdrawing or releasing said buoyant object;

c. said drive means being mounted on said elongated structure;

d. said base member includes a plurality of downwardly extending blades;

e. a plurality of angularly positioned plates are each positioned between adjacent downwardly extending blades;

f. a limit sensor assembly is mounted on said elongated structure;

g. a position indicator comprising magnetic conducting material operatively connected to said support cable;

h. control means responsive to the interaction of said limit sensor assembly and said position indicator for stopping said drive means;

i. said limit sensor assembly includes first and second spaced apart coils surrounding said support cable;

j. said control means including inductance responsive means; and

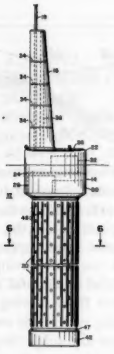
k. said inductance responsive means generating a signal of a first frequency when said position indicator is not interacting with said limit sensor assembly and generating a signal of a second frequency when said position indicator is interacting with said first coil and generating a signal of a third frequency when said position indicator is interacting with said second coil.

3,906,565

DRIFTING OCEAN BUOY

William T. Dorrance, El Cajon, and Norman W. Schofield, San Diego, both of Calif., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed Mar. 28, 1974, Ser. No. 455,778
Int. Cl.² B63B *35/00*
U.S. Cl. 9—8 R **17 Claims**



1. In an ocean buoy, a drag structure which is matched to the ocean current and is adapted to be dragged along and follow the current, said structure being adapted to be submerged below a floating hull, said structure comprising an elongated cylindrically tubular body having its upper end attached to said hull and being open at the end thereof opposite from said hull, said body having a plurality of holes distributed between the ends thereof over substantially the entire surface area thereof and extending through the walls of said body for venting said body for passage of water into and out of said body, a plurality of ribs disposed on the exterior of said body and extending longitudinally substantially the entire length thereof, said holes being located between adjacent ones of said ribs, said holes and said ribs providing a drag shape closely coupling and matching said structure to the ocean current.

3,906,566

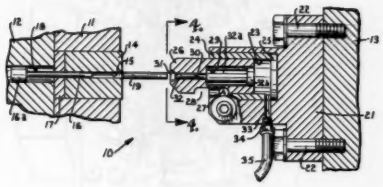
PNEUMATIC BIASING SYSTEM FOR A SCREW BLANK COLD HEADING MACHINE

Joel S. Rose, 9806 Cedar Dr., Overland Park, Kans. 66207

Filed July 5, 1974, Ser. No. 485,800
Int. Cl.² B23G *9/00;* **B21K** *1/44*
U.S. Cl. 10—2 **4 Claims**

1. In an apparatus for cold heading screw blanks, said apparatus including a die having an aperture for receiving a portion of a screw blank, a punch having an aperture for receiving the remainder of the screw blank, means for holding the screw blank between said punch and die, means including a recess in the forward end of said punch and a pin slidably disposed in said punch aperture for forming a head on a screw blank, and power means for moving said punch toward said die to actuate said head forming means, the improvement comprising:

a punch block adapted for coupling to said power means in opposition to said die and having an opening for slidably receiving said punch, said opening defining a confined space rearwardly of said punch with said confined space varying in volume according to the position of said punch in said opening, said punch block having a passage therein extending from the exterior of said punch block



and terminating at the inward end of said opening to deliver air to the confined space thereof; and

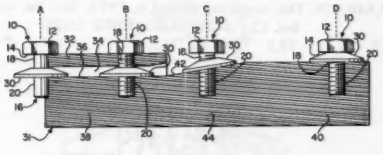
an air source adapted for coupling to said passage and operable to introduce pressurized air through said passage and into the confined space of said opening, whereby said punch is biased forwardly against said die to confine the screw blank in said punch and die apertures as said head forming means forms a head on the screw blank, while said punch is able to slide rearwardly in said opening against the biasing force of the pressurized air.

3,906,567

METHOD AND APPARATUS FOR ASSEMBLING A SCREW AND COMPRESSIBLE WASHER

Gerald Dean Barth, Elgin, and David Prugh Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed May 30, 1974, Ser. No. 474,502
Int. Cl.² B23P *19/08*
U.S. Cl. 10—155 A **10 Claims**



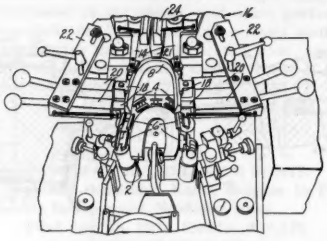
1. A method of fabricating a screw and washer assembly comprising the steps of telescopically associating a discrete axially compressible washer with a screw blank which includes an unthreaded shank and a radially enlarged head, positioning the washer intermediate the undersurface of the head and the extremity of the shank so that an axial extent of the unthreaded shank extends above and below the washer, swaging the periphery of at least the shank extending above the washer to produce at least a circumferential portion thereof of less diameter than the diameter of the unthreaded shank, moving the washer upwardly on the shank to a position directly adjacent the undersurface of the head, swaging the shank portion extending below the washer with a thread form which includes a crest diameter greater than the diameter of the inner periphery of the washer.

3,906,568

BAND WIPING MECHANISM FOR SHOE LASTING MACHINE

Alfred J. Decareau, South Hamilton, and Richard A. Collins, Beverly, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 30, 1974, Ser. No. 465,607
Int. Cl.² A43D *14/00, 21/00*
U.S. Cl. 12—7.5 **3 Claims**



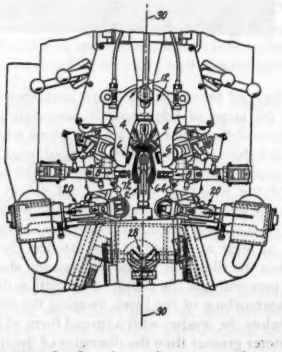
1. A machine for lasting stitchdown type of shoes in which an insole has a marginal extension projecting beyond the peripheral edge of a last bottom and an outturned margin of a shoe upper is secured to the insole extension including a support for the shoe bottom generally co-extensive marginally with the insole extension at least about one end of the shoe, a U-shaped flexible band generally corresponding to the shape of said end of the shoe, means for causing relative bodily movement between the band and the support heightwise of a shoe on the support for wiping the upper heightwise about said end of the last and for pressing said outturned margin against the insole extension, means for applying an additional force for relatively moving the band and support to apply an added bedding pressure to compress and secure together the insole and margin of the upper, said machine also having grippers which are yieldably engageable with the periphery of the support to locate the last and insole in the machine.

3,906,569

PULLING AND LASTING MACHINES

Derek H. Garner; George H. Bosworth, and Roger M. Barker, all of Leicester, England, assignors to USM Corporation, Boston, Mass.

Division of Ser. No. 308,694, Nov. 22, 1972, Pat. No. 3,840,929. This application May 6, 1974, Ser. No. 466,967
Int. Cl.² A43D *21/00;* **H05B** *33/28*
U.S. Cl. 12—10.1 **7 Claims**



1. In a machine for forming a shoe upper about a last having an insole positioned on the last, machine elements for applying cement to the insole comprising:

means for locating the upper, last and insole in the machine;

a generally planar U-shaped plate having a surface initially spaced from the insole for engaging the insole and applying cement to the engaged insole;

means for moving said plate to engage the insole with only a portion of the surface of said plate; and

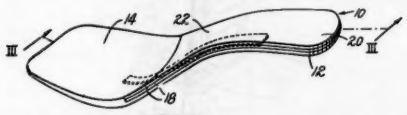
means for rocking said plate to engage the insole with the entire surface of said plate.

3,906,570

METHOD OF MAKING AN INSOLE

Howard B. Revill, Oadby, England, assignor to USM Corporation, Boston, Mass.

Division of Ser. No. 342,999, March 20, 1973, Pat. No. 3,835,558. This application May 24, 1974, Ser. No. 473,273
Int. Cl.² A43D *00/00*
U.S. Cl. 12—146 B **8 Claims**



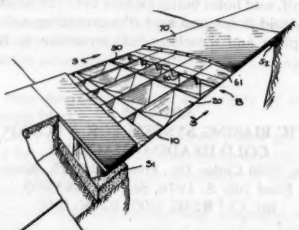
1. The method of making an insole comprising forming an assembly in face to face relation of a through layer of non-woven bonded fiber comprising a thermoplastic bonding agent having a softening point below the melting point of the fiber of said layers and above the temperatures to which said insole will be subjected in use and having an outline shape corresponding to that of the insole and at least one short layer or a non-woven bonded fiber having an outline shape corresponding with or lying within the outline shape of a rear portion of a through layer and subjecting the assembly to heat and pressure to bond said through and short layers together through the action of said bonding agent and to densify portions of said assembly comprising both through and short layers so that said portions have greater density and rigidity than portions not comprising both through and short layers.

3,906,571

STRUCTURAL MEMBER OF SHEET MATERIAL

Lev Zetlin, 89 Hamilton Dr., Roslyn, N.Y. 11576

Division of Ser. No. 132,390, April 8, 1971, Pat. No. 3,849,237. This application May 30, 1974, Ser. No. 474,527
Int. Cl.² E04C *3/02*
U.S. Cl. 14—17 **6 Claims**



1. A bridge for spanning the distance between a pair of horizontally spaced supports;

longitudinal web means of sheet material consisting of a pleated sheet member extending substantially horizontally between the supports and having a saw-tooth profile in a transverse plane, said pleats of said sheet member

comprising planar mutually inclined walls defining alternately upwardly and downwardly open longitudinal channels in side-by-side relation;

a plurality of pyramid-shaped hollow elements of sheet material longitudinally distributed along and located in side-by-side relation, in at least a pair of said upwardly and an intermediate one of said downwardly open channels, each of said hollow elements having a pair of opposed wall portions in face-to-face contact with adjacent walls of said pleated member, respectively;

said hollow elements in said upwardly open channels having closed planar base portions located substantially in a common plane defined by the upper fold lines of said pleated member;

planar decking means of sheet material overlying said closed planar base portions of said hollow elements; and

connecting means connecting together said hollow shell elements with said decking means and with said pleated member at corresponding overlying surface portions thereof.

3,906,572

APPARATUS FOR MANEUVERING ON A SUBMERGED SURFACE

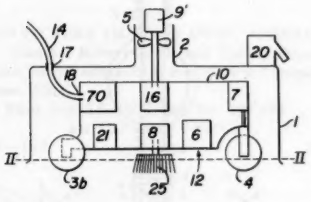
Russell Edward Winn, Kilbrittain Castle, Ireland, assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 65,449, Aug. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 752,195, Aug. 13, 1968, abandoned, which is a continuation-in-part of Ser. No. 531,459, March 3, 1966, abandoned. This application July 12, 1973, Ser. No. 378,660

Claims priority, application United Kingdom, Mar. 4, 1965, 9323/65

Int. Cl.[2] B63B *59/02*

U.S. Cl. 15—1.7 **7 Claims**



1. An apparatus capable of being driven along a submerged surface and cleaning said surface, comprising a chamber having an open side, supporting means for maintaining the open side of said chamber at a distance from said surface, said supporting means including wheel means, driving means connected to said wheel means for causing said chamber to move along said surface, pressure reducing means operably connected with said chamber for continuously maintaining a reduced pressure inside the chamber relative to the pressure outside the chamber, steering means mounted with said chamber for directionally moving said apparatus as it is driven along the submerged surface, said wheel means further including a wheel operably connected with said steering means and capable of being swivelled through an angle of at least 90°, and cleaning means comprising brush means mounted for rotation about an axis substantially perpendicular to the surface to be cleaned, means to rotate said brush means so that when said brush means are compressed against said surface the bristles thereon rotate in a plane substantially parallel to said surface.

3,906,573

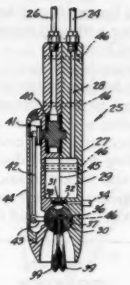
OSCILLATING POWER PAINT BRUSH

John W. Crawford, 1674 Virginia Rd., Los Angeles, Calif. 90019

Filed July 9, 1973, Ser. No. 377,414

Int. Cl. A46b *13/04*

U.S. Cl. 15—22 R **4 Claims**



1. An oscillating power actuated paint brush compising a paint brush body including a handle, a source of air under pressure an elongated shank mounted for oscillation about its longitudinal axis in said body, a plurality of bristles mounted endwise in said shank, means feeding paint under pressure to said bristles, valve plate means transversely thereof and positioned entirely within said body but for their extremities so that the bristles oscillate back and forth as the shank oscillates in said body for controlling the flow of paint from said last named means to said bristles, and power actuated means driven by said air under pressure for oscillating said shank to oscillate said bristles.

3,906,574

DEVICE FOR PERSONAL HYGIENE

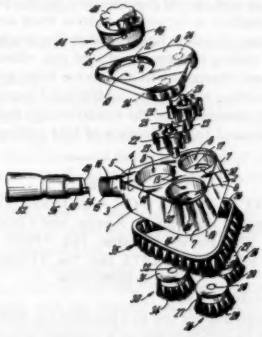
Charles Kaeser, Ch. de Rennier 18, 1009 Pully, Switzerland

Filed Feb. 25, 1974, Ser. No. 445,076

Claims priority, application Switzerland, Apr. 30, 1973, 6138/73

Int. Cl.[2] A46B *13/06*

U.S. Cl. 15—29 **12 Claims**



1. A device for personal hygiene comprising:

a. a body having a socket connectable to a water supply source;

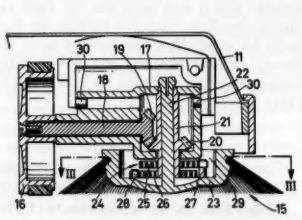
b. said body having at least one recess formed in the top thereof;

c. said body having an open cavity formed in the bottom thereof, said cavity communicating with said recess;
d. a turbine wheel rotatably mounted in said recess, said turbine wheel having a spindle which passes through the body to extend into said cavity;
e. a rotary brush removably mounted on said spindle in said cavity, said brush having bristles extending out of the body;
f. a release chamber formed in said body, said release chamber communicating with said recess by means of a channel formed in said body;
g. a soap holder removably located in said release chamber, said soap holder having within said release chamber a lateral wall at least partly perforated;
h. said body including a first duct therein, said first duct connecting said socket to said cavity;
i. said body including a second duct therein, said second duct connecting said socket to said release chamber; and
j. a flow control means to divert the flow of water passing through said socket towards said first or second duct.

3,906,575
SWEEPER

Johannes Liebscher, Nassau (Lahn), Germany, assignor to Leifheit International Gunter Leifheit Gesellschaft mit Beschrankter Haftung, Nassau (Lahn), Germany

Filed Oct. 1, 1974, Ser. No. 510,845
Claims priority, application Germany, Oct. 2, 1973, 2349395
Int. Cl.[2] A47L *11/33*
U.S. Cl. 15—42 **14 Claims**



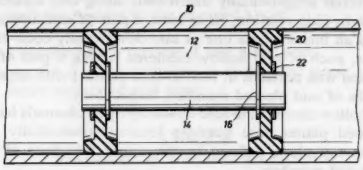
1. In a sweeper, particularly for floors, carpets and the like, a combination comprising a housing; wheels supporting said housing for rolling movement on a surface to be swept; a brush rotatably mounted in said housing and having portions which engage the surface to be swept; a drive train connecting said brush with one of said wheels so that the brush is rotated in response to rolling movement of said one wheel; and energy storing means interposed in said drive train to store energy during said rolling movement, so that said brush continues to be rotated by dissipation of the stored energy from said storing means subsequent to termination of said rolling movement.

3,906,576
RESILIENT ELEMENT FOR A BI-DIRECTIONAL PIG

Mary M. Knapp; Kenneth M. Knapp, and Charles C. Knapp, Jr., all of 1209 Hardy, Houston, Tex. 77020

Filed July 9, 1973, Ser. No. 377,420
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 R **9 Claims**

1. A resilient cup for use in a pipeline pig which enables the pig to move bi-directionally in a pipeline wherein the cup is adapted to be joined to a pipeline pig body comprising a central web portion having means which is adapted to engage a pipeline pig body wherein the central web portion extends radially outwardly and lies in a common plane generally perpendicular to the length of the pipeline pig body, a flange on the outer end of said web portion, said flange being symmetrically arranged on both sides of the aforementioned plane and having an outer surface on said flange which is adapted to contact and clean the inner wall of a pipeline wherein the outer surface is not parallel to the inner wall of such a pipeline

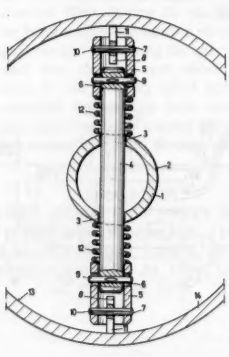


and wherein said central web is flexible and able to bend such that said outer flange bends on both side of the aforementioned plane while maintaining the outer surface thereof in a position to be contacted against a pipeline to be cleaned.

3,906,577
SPRING-LOADED SCRAPER BLADE HOLDER ON SCRAPER SHAFTS OF SCRAPER COOLERS

Peter Brucher, Berlin, Germany, assignor to Borsig Gesellschaft mit beschrankter Haftung, Berlin, Germany

Filed Oct. 2, 1973, Ser. No. 402,859
Claims priority, application Germany, Oct. 3, 1972, 2248964
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.1 R **3 Claims**



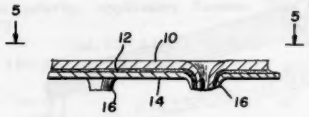
1. For use in connection with a tube the inner wall of which is to be scraped in a continuous manner, the combination of a scraper shaft with a plurality of diametrical bores therethrough, holding bolts respectively extending through and freely slidable in said bores, tubular sleeves respectively connected to at least one end portion of said holding bolts, each of said tubular sleeves being provided with a diametrical slot, scraper blade means located in said slots, connecting means respectively connecting said scraper blade means to said tubular sleeves for scraping engagement with the inner wall of a tube to be scraped, and helical pressure spring means interposed between said scraper shaft and said tubular sleeves while respectively surrounding the pertaining holding bolts and urging said pertaining tubular sleeves and thereby the scraper blade means connected thereto in radial outward direction.

3,906,578

LINT REMOVER HAVING LOCALIZED PROJECTIONS

W. Rene Huber, 42 Mill Glen Rd., Upper Saddle River, N.J. 07458

Filed Oct. 17, 1973, Ser. No. 407,143
Int. Cl.[2] A47L 25/08; B32B 3/10, 7/06
U.S. Cl. 15—104 A 5 Claims



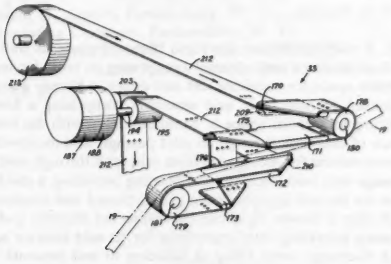
1. A lint remover pad for fabrics, said remover as prepared for the eventual use by the user including: (a) a flexible sheet providing a backing member of paper material and having sufficient rigidity to retain deformations such as made by sharpened pins; (b) a permanently "tacky" adhesive material applied as a coating to substantially all of one surface of the backing member; (c) a releasable and removable protective cover sheet contiguously placed on the "tacky" adhesively coated surface to protect said surface against undesired contamination, and (d) a multiplicity of tooth shaped short projections formed in the backing member throughout the same by piercing the sheets with sharpened pins, said projections extending from the adhesively coated side and carrying on their outer surfaces the "tacky" adhesive, said projections being sufficiently rigid to act as comb-like teeth so that as and after the protective cover sheet has been removed and the pad is moved over and patted on the fabric being cleaned these projections, when moved across the cloth, enter into the nap, rib and valley portions to engage the debris therein and to cause added disturbance to the fibers thus increasing the pad's ability to draw foreign matter to its adhesive surface.

3,906,579

MOTION PICTURE FILM CLEANING APPARATUS

Warren C. Manske; Robert Bretl, and Carlon Strutz, all of Menominee, Mich., assignors to Bay Electric Company, Inc., Menominee, Mich.

Filed Aug. 15, 1974, Ser. No. 497,655
Int. Cl.[2] G03C 11/00
U.S. Cl. 15—100 6 Claims



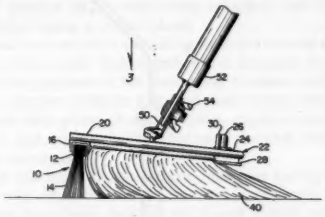
1. A motion picture film cleaning apparatus for cleaning both sides of a motion picture film as it is longitudinally moved comprising a panel, a plurality of cleaning tape guides carried by the front side of the panel with the motion picture film extending therebetween as it is longitudinally moved, a single cleaning tape threaded over said cleaning tape guides with one side of the cleaning tape engaging and cleaning one side of the moving motion picture film and with the other side of the cleaning tape engaging and cleaning the other side of the moving motion picture film, and means for advancing said cleaning tape over said cleaning tape guides to present fresh cleaning surfaces of the cleaning tape to the motion picture film as it engages and cleans both sides of the moving motion picture film.

3,906,580

COMBINED MOP AND BRUSH ATTACHMENT

William W. Smith, and Lawrence W. Alfred, both of Denver, Colo., assignors to Robert R. Anderson, Greeley and William W. Smith, Denver, both of, Colo., part interest to each

Filed June 12, 1974, Ser. No. 478,770
Int. Cl.[2] A46B 15/00; A47L 13/12, 13/253
U.S. Cl. 15—115 5 Claims



1. A brush in combination with a mop having a frame of the type having a pair of like outwardly extending U-shaped wings pivotally connected together between ends thereof, the wings, when in planar relationship, adapted to engage within opposed pockets at the top of an elongated mop, and when disposed in non-planar relationship, adapted to permit removal of the mop therefrom, said wings forming generally parallel legs at the front and rear edges thereof, and means for locking said wings in planar relationship, comprising:

said brush being elongated and of a length coextensive with the length of the mop and having bristles adapted to sweep a floor ahead of the mop, and

means for releasably securing said brush to said generally parallel legs.

3,906,581

PAINT ROLLER

Frank Marino, 1593 Wales Ave., Baldwin, N.Y. 11510, and Thomas D. Hadnagy, 17 Briar Ln., Roslyn Heights, N.Y. 11577

Filed Mar. 1, 1974, Ser. No. 447,094
Int. Cl.[2] B05C 17/02
U.S. Cl. 15—230.11 2 Claims

1. A paint roller, which comprises:

a tubular roll;

a shaft supporting said roll for rotation;

a first plug secured to and sealing one end of said roll and having interior surfaces defining a guide to receive a first end of said shaft;

a second plug secured to and sealing the other end of said roll and having an opening extending therethrough which is coaxial with said roll;

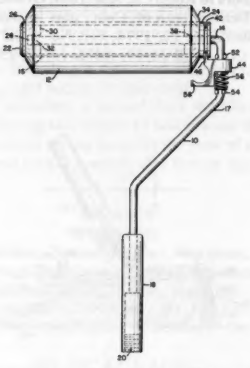
said shaft passing through the opening of said second plug and into said roll so that said first end of said shaft seats in said guide and the second end of said shaft extends outwardly of said opening so that said second plug extends radially from said shaft;

said second plug having a circular groove track disposed on the outer periphery thereof;

a handle extending from said second end of said shaft;

a latching member movably mounted on said handle and shiftable radially of said roller between a first position wherein said member is captured in said groove track of said second plug member, whereby rotation of said roll is

permitted about said shaft but longitudinal movement of said roll with respect to said shaft is restricted and a second position wherein said latching member is free of said groove track, whereby longitudinal movement of said roll with respect to said shaft is permitted; and



spring means mounted on said handle and engaging said latching member to yieldingly urge said member into frictional engagement with the surface of said second plug, within said groove track.

3,906,582

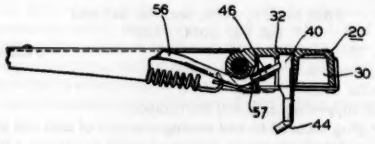
WINDSHIELD WIPER ARM

Bronislaus S. Graczyk, Snyder, and William C. Riester, Williamsville, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,071

Int. Cl.[2] B60S *1/46*

U.S. Cl. 15—250.04 **6 Claims**



1. In a windshield cleaning system comprising a wiper arm having a mounting head adapted to be secured to a pivot shaft for movement therewith, a washer fluid discharge nozzle mounted on said wiper arm and a concealed flexible tube for conducting fluid from a fluid source through said arm to said discharge nozzle, a recess located in said mounting head, a tube adapter, having an internal bore, disposed in said recess, means for releasably retaining said tube adapter in said recess, an inlet tube connection communicating with said internal bore extending from said tube adapter and an outlet tube connection communicating with said internal bore positioned within said wiper arm extending from said tube adapter in a direction generally parallel to the longitudinal axis of said wiper arm.

3,906,583

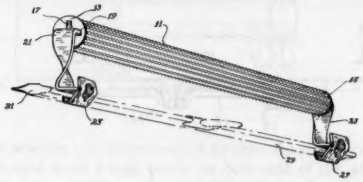
WINDSHIELD CLEANING DEVICE

Patrick W. Murphy, 126 Dunlop Ave., Tonawanda, N.Y. 14150

Filed Dec. 12, 1973, Ser. No. 424,052

Int. Cl. B60s *1/02*

U.S. Cl. 15—250.03 **12 Claims**



1. A windshield cleaning device adapted for attachment to a windshield wiper which comprises a tubular cleaning element having two ends, an adapter at each such end sized to fit securely to the cleaning element, at least one of such adapters being removable, each adapter having an opening therein, and a pair of holding arms, each arm having means thereon for securing it to the windshield wiper and each having an end of a shape for fitting into the respective openings in the ends of the adapters, thereby to hold the cleaning element in windshield cleaning position with respect to the wiper.

3,906,584

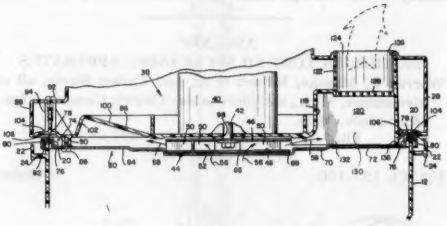
VACUUM CLEANER WITH DIVIDED DISCHARGE

David R. Hult, Columbus, Ind., assignor to Vernco Corporation, Columbus, Ind.

Filed Nov. 23, 1973, Ser. No. 418,560

Int. Cl.[2] A47L *5/14*

U.S. Cl. 15—347 **14 Claims**



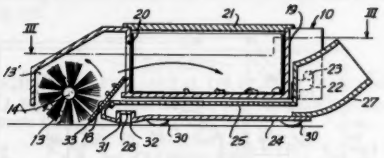
1. A vacuum cleaner having a blower feature as well as a pickup feature, said cleaner comprising a tank having an interior space for receiving dirt and debris, a blower assembly mounted on said tank, said assembly comprising a housing defining an interior space in communication with the interior space of said tank through an inlet passage, and motor-driven blower means for moving air from said tank through said inlet passage into said housing, said housing providing a discharge port for its said interior space proportioned and constructed such that a blower hose can be connected thereto, and said housing providing discharge vents for its said interior space, said discharge vents being in addition to and separate from said discharge port, said housing being devoid of valve means between said discharge vents and discharge port such that said vents and port are always in communication and open, said tank being generally cylindrically shaped and upright with said blower housing being generally coaxially mounted on said tank, said housing being axially relatively shallow and constructed to provide upper and lower, generally radially outwardly extending circular walls, with said discharge port in said upper wall, said inlet passage in said lower wall and said discharge vents between the outer peripheral edges of said

walls, and said blower means being disposed between said upper and lower walls to direct the air radially outwardly toward said discharge vents.

3,906,585
FLOOR TREATING APPARATUS

Bo Gunnar Mattsson, Sollentuna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Dec. 10, 1973, Ser. No. 423,110
Claims priority, application Sweden, Dec. 15, 1972, 16414/72
Int. Cl.² A47L *9/04, 9/10*
U.S. Cl. 15—349 **8 Claims**



1. In a floor treating apparatus, the combination of

a. a hollow body comprising at least two parts in which one of said parts is provided with an inlet for air and an air outlet adapted to be connected to a source of suction during normal operation of the apparatus,

b. a structure remote from the suction inlet for picking up large particles of waste material such as scraps of paper and the like, said structure comprising an agitator means disposed in the other of said hollow body parts, the latter including a receptacle in communication with said agitator means for collecting the waste material,

c. said receptacle of the other hollow body part fully overlying said one hollow body part, and

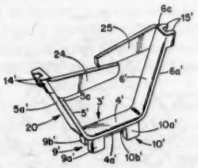
d. an inclined surface located adjacent to said agitator means and between the latter and said receptacle which functions to convey the waste material flung up by the agitator means from the floor to said receptacle.

3. Apparatus as set forth in claim **1** which includes means for tiltably supporting the rear end of the other of said hollow body parts on said one of said hollow body parts.

3,906,586
PROTECTOR DEVICE

William O. Arnold, Parkersburg, W. Va., assignor to Union Insulating Company, Parkersburg, W. Va.

Filed Dec. 10, 1974, Ser. No. 531,379
Int. Cl.² B65D *7/48, 11/26, 55/00;* **F16L** *5/00*
U.S. Cl. 16—2 **9 Claims**



1. A protector device for providing 360° protection for an elongated member arranged to pass through the protector device and through an opening in a construction member in which the protector device is adapted to be inserted, said protector device comprising:

a main body member including:

a. a base portion having first and second end regions;

b. a first flexible side portion extending upwardly from and forming an angle with the first end region of the base portion; and

c. a second flexible side portion extending upwardly from and forming an angle with the second end region of the base portion;

gripping means associated with the base portion of the main body member for gripping at least one portion of a construction member at the periphery of an opening in the construction member;

confinement means associated with the first and second side portions of the main body member for engaging other portions of the construction member at the periphery of the opening in the construction member;

a first arm member extending from the first side portion of the main body member in a direction toward the second side portion of he main body member, said first arm member being in a first plane;

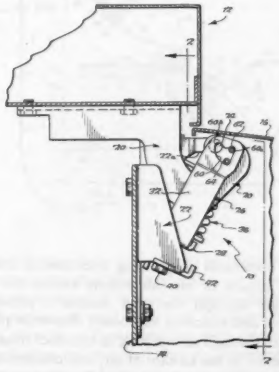
a second arm member extending from the second side portion of the main body member in a direction toward the first side portion of the main body member, said second arm member being in a second plane offset with respect to the first plane of the first arm member whereby an open space is established between the first and second arm members;

each of the first and second arm members having a length whereby when the first and second flexible side portions of the main body member are flexed toward each other the first and second arm members move past each other in opposite directions.

3,906,587
LID MOUNTING HINGE AND COUNTERBALANCE MECHANISM

Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Continuation-in-part of Ser. No. 422,745, Dec. 7, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 505,491The portion of the term of this patent subsequent to Sept. 20, 1991, has been disclaimed.
Int. Cl.² E05F *1/12*
U.S. Cl. 16—190 **19 Claims**



1. A cover mounting combination hinge and counterbalance mechanism for mounting a lid upon a cabinet for vertical swinging movement between essentially horizontally disposed fully closed and essentially vertically disposed fully open positions, said mechanism including:

first and second bracket means adapted to be attached one to each of said lid and said cabinet;

hinge pin means pivotally interconnecting said first and second bracket means;

a hanger member;

first and second pivot pins carried by one of said hanger member and said first bracket means;

bearing opening means defined by the other of said hanger member and said first bracket means, said first pivot pin being arranged for bearing engagement with said opening means during movement of said lid between said fully closed position and an intermediate position, said second pivot pin being arranged for bearing engagement with said opening means during movement of said lid between said intermediate position and said fully open position; and

means interconnecting said hanger member and said second bracket means including spring means for exerting forces on said first bracket means through said hanger member and said first pivot pin for establishing a torque opposing movement of said lid from said intermediate position towards said fully closed position and for exerting forces on said first bracket means through said hanger member and said second pivot pin for establishing a torque opposing movement of said lid from said intermediate position towards said fully open position.

3,906,588

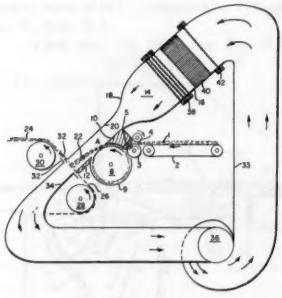
AIR-LAYDOWN APPARATUS FOR ASSEMBLING FIBERS INTO WEBS

Dimitri P. Zafiroglu, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 322,757, Jan. 11, 1973, Pat. No. 3,797,074, which is a continuation-in-part of Ser. No. 241,924, April 7, 1972, abandoned, and Ser. No. 135,734, April 20, 1971, abandoned, and Ser. No. 135,735, April 20, 1971, abandoned. This application Feb. 14, 1974, Ser. No. 442,404

Int. Cl.² D01G *25/00*

U.S. Cl. 19—156.3 **7 Claims**



1. In an apparatus comprising duct means for conveying fibers in a stream of air, air supply means for directing a stream of air through the duct means, a rotating toothed disperser roll and coacting stationary disperser plate for projecting fibers through an opening in the duct means to form a stream of fibers in the stream of air, and condenser means for separating the fibers from the air to form a web; the improvement for high speed production of uniform webs which comprises, in the air supply means, a highly uniform air passage with a larger cross-sectional area than said duct means connected directly to the duct means by a converging section in the form of a smooth, gradual curve, in combination with screens and a honeycomb structure located in the larger air passage to provide a uniform flow substantially free of turbulence and vorticity.

3,906,589

SUPPORTS FOR CANS WITH ROTATION DURING TRANSLATION MOTION AT THE OUTLET FROM TEXTILE MACHINES

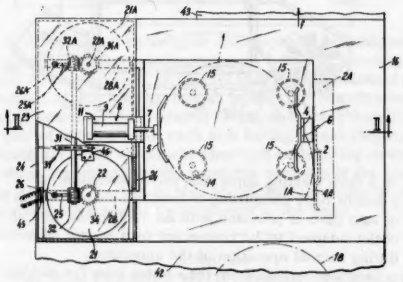
Roger Gauvain, Buhl, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed Oct. 23, 1973, Ser. No. 408,429

Claims priority, application France, Oct. 26, 1972, 72.37964

Int. Cl.² B65H *54/78*

U.S. Cl. 19—159 R **4 Claims**



1. A can support for circular translation motion at the outlet from a textile machine, comprising a bed plate, a horizontal platform above said bed plate, means mounted on said platform for securing a can in place, at least three cylindrical bowls fixed to said bed plate, a ball arranged in each said bowl, said platform resting on said balls, two parallel horizontal cranks supported on said bed plate with each of said cranks being articulated at two spaced points on said platform for imparting motion to the platform, synchronisation transmission means operatively connecting said two cranks to each other and rotary drive-transmitting means operatively connected to the synchronisation transmission means.

3,906,590

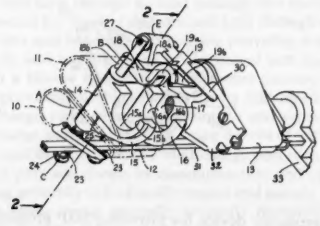
WEIGHTING DEVICE FOR SPINNING FRAME DRAFTING SYSTEM

Kenneth P. Swanson, Fort Lauderdale, Fla., assignor to Progressive Engineering, Inc., Simpsonville, S.C.

Filed Sept. 4, 1973, Ser. No. 393,808

Int. Cl.² D01H *5/50*

U.S. Cl. 19—267 **4 Claims**



1. Apparatus for weighting the middle top roll of a spinning frame having a middle bottom roll comprising:

A. A first bracket having an opening for reception upon the middle bottom roll for rotation therein;

B. a second bracket having an opening opposed to said opening of the first bracket for reception upon the middle top roll;

C. resilient means exerting a force urging said first and second brackets together including;

I. a pair of spaced aligned pins slideably carried by said first bracket,

II. a coiled spring carried by an end of each pin adjacent said first bracket, and

III. means adjacent the other end of each pin for compressing said coiled springs thereby urging said second bracket toward said first bracket.

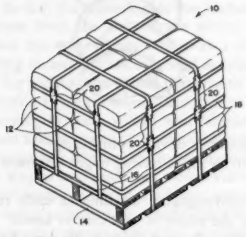
whereby a predetermined fixed force may be exerted during spinning between said middle bottom roll and said middle top roll.

3,906,591

BRIDGING CLIP FOR METAL OR PLASTIC BANDING

Mario J. Boiardi, Cleveland Heights, Ohio, assignor to Boiardi Products Corporation, New York, N.Y.

Filed July 30, 1974, Ser. No. 493,350
Int. Cl.² B65D *63/06*
U.S. Cl. 24—23 W **9 Claims**



1. A bridging clip attached at the junction of two transversely oriented and circumferentially extending straps,

the straps extending around the periphery of a stack of goods prepared for shipping, one of said straps comprising a vertical strap lying in a vertical plane and the other comprising a horizontal strap lying in a horizontal plane, said clip including vertically aligned end sections, said end sections being joined by an intermediate bridging section,

each said end section including two opposed leg portions spanned by a flat portion, one said leg portion being on each side of each flat portion and extending from said flat portion toward and beyond the vertical strap, the distal end of each leg portion being deflected to extend toward its opposed leg portion, whereby, in cross-section the vertical strap is sandwiched between each said flat portion and the deflected portions of said legs,

the clip being rigidly mechanically attached to the vertical strap by a deformation of an end section of said clip, there being no mechanical attachment of the clip to the horizontal strap,

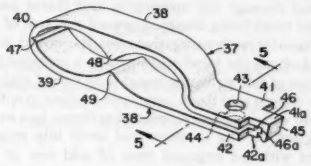
the bridging section lying parallel to a vertical surface of the horizontal strap and extending both above and below said horizontal strap with the bridging section joining the two end sections where one end section is below the horizontal strap and the other end section is above the horizontal strap, said horizontal strap lying between the bridging section and the vertical strap, the vertical spacing between the end sections being greater than the heighth of said vertical surface thereby allowing relative movement between said straps to relieve unbalanced tensions without allowing the horizontal strap to move vertically any substantial distance.

3,906,592

WIRING OR PIPING CLAMP

Hiroshi Sakasegawa, Yokohama, and Yasuo Shindome, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Apr. 25, 1974, Ser. No. 464,247
Int. Cl.² A44B *21/00*
U.S. Cl. 24—73 AP **10 Claims**



1. A clamp for fixing a flexible line to a surface of a support wall, comprising:

a pair of gripping portions hingedly connected to each other through a hinged end for forming therebetween a space to receive therein the flexible line;

end portions respectively extending opposite to the hinged end from the gripping portions and formed with aligned holes to receive therethrough a fastening means by which the clamp is to be fastened to the wall surface;

cooperating securing means at the outer ends of said end portions for releasably securing said end portions together and thereby maintaining said clamp in closed condition, and

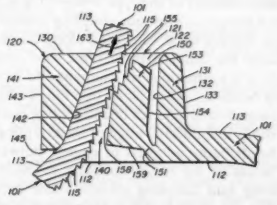
spacing means adjacent the outer ends of said end portions for spacing said end portions apart inboard of said spacing means when said end portions are secured together by said securing means, said spacing means acting as a fulcrum about which said end portions pivot when fastening means received in said holes is tightened and thereby clamp said flexible line with selected tightness.

3,906,593

INTEGRAL CABLE TIE

Jack E. Caveney, Chicago, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corporation, Tinley Park, Ill.

Filed Apr. 8, 1969, Ser. No. 814,252
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **6 Claims**



6. An integral one-piece cable tie to be tensioned about a bundle of wires and the like, said cable tie comprising an elongated flexible strap, a row of autments diposed on one longitudinal surface of said strap and arranged transversely with respect thereto, a frame integral with one end of said strap and including an end wall and an abutment wall, said frame having an entry surface and an exit surface and a strap-receiving opening extending therethrough, a pawl disposed within said frame in said strap-receiving opening and pivotally mounted on and integral with said end wall, said abutment wall having a strap-bearing surface disposed toward said pawl and defining therewith a strap-receiving throat, and a tooth on said pawl arranged trasversely with respect thereto and disposed toward said abutment wall and shaped to engage said

row of abutments on said strap, said frame having a channel in said entry surface through said abutment wall for receiving said strap therein to permit said frame to lie closed to the associated bundle of wires in the tensioned condition, said channel extending in a direction in longitudinal alignment with said strap and entirely through said abutment wall to receive said strap therein, said strap being deformable into a loop encircling a bundle of wires with the free and of said strap extending through said channel into said strap-receiving throat and through the opening in said frame and therebeyond, said tooth being disposed toward said row of abutments and engageable with successive ones thereof as said strap is tightened about the bundle of wires to a tensioned condition and release of said strap causing at least one of said abutments firmly to engage said tooth, any force tending to withdraw said strap from within said strap-receiving throat in a strap-loosening direction serving to move said tooth into more firm engagement with the engaged ones of said row of abutments firmly to grip said strap between said strap-bearing surface and said pawl, whereby to prevent inadvertent withdrawl of said strap from said frame and thus to lock said strap in its tensioned condition about the bundle of wires.

3,906,594
TOP STOPS FOR SLIDE FASTENERS

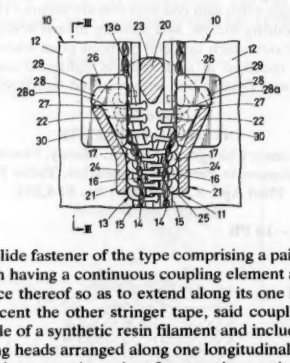
Kihei Takahashi, Uozu, and Shunji Akashi, Kurobe, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,827

Claims priority, application Japan, Dec. 29, 1973, 49-3167[U]

Int. Cl. A44b *19/36*

U.S. Cl. 24—205.11 F **2 Claims**



1. In a slide fastener of the type comprising a pair of stringer tapes each having a continuous coupling element arranged on one surface thereof so as to extend along its one longitudinal edge adjacent the other stringer tape, said coupling element being made of a synthetic resin filament and including a series of coupling heads arranged along one longitudinal edge of the coupling element and a series of connective portions arranged along the other longitudinal edge of the coupling element, said coupling heads being adapted to engage between the similar coupling heads of the other coupling element, and a slider slidable along said coupling elements and including a body having a flared top end and a contracted bottom end, said slider body including a front wing and a back wing which are interconnected by a web located at said flared top end, said front wing of said slider body having a pair of side flanges, the combination thereof with a pair of top stops made of synthetic resin material and fused to said stringer tapes at the upper extremities of said coupling elements, respectively, each of said top stops integrally comprising a stop portion against which the top edge of one of said side flanges of said front wing abuts when said slider is moved along said continuous coupling elements to its predetermined topmost position on the slide fastener, and a guide portion which is substantially in the shape of a right-angled triangle as seen in a plan view and which generally tapers in a direction away from the top end of the slide fastener, said guide portion being adapted to enter relatively into said slider body through said flared top end when said slider is moved close to said predetermined topmost position and hence to guide said slider to said predetermined topmost position, said stop portion of each top stop being substantially rectangular in shape and being greater than said guide portion both in height and in a dimension in a transverse direction of the stringer tape, said stop portion and said guide portion of each top stop enveloping and uniting integral with several of said connective portions, including the topmost one, of the corresponding coupling element.

3,906,595
SLIDE FASTENER

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed July 18, 1973, Ser. No. 380,323

Int. Cl. A44b *19/12*

U.S. Cl. 24—205.13 C **6 Claims**

1. A slide fastener device comprising

a pair of carrier tapes having edges disposed adjacent each other,

a pair of interengaging continuous coils respectively attached to the edges of said carrier tapes,

each coil being formed from a filament having a central core axis and having an elliptical cross section transverse to the central core axis,

each coil having a plurality of convolutions disposed along a longitudinal axis parallel to a longitudinal axis defined by its carrier tape edge,

each convolution of each coil including a bight element, first and second links extending from said bight element and a connector member interconnecting a first link of one convolution with a second link of an adjacent convolution,

each convolution of each coil being substantially identical to its adjacent convolution,

each first link having a cross section with a major axis different from a major axis of a cross section of each second link,

the bight elements, first and second links and connector members of one coil being of substantially identical construction to the respective bight elements first and second links and connector members of the other cool

the bight elements of one coil being generally adjacent the connector members of the other coil,

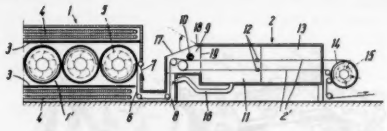
the first links of one coil each having its central core axis parallel to the central core axis of each first link of the other coil and said first links of the one coil nesting with the first links of the other coil in a first pattern defining a generally parallel arrangement, and

the second links of the one coil each having its central core axis displaced from the central core axis of each second link of the other coil and said second links of the one coil nesting with the second links of the other coil in a second pattern different from said first pattern and defining a generally herringbone arrangement whereby the filamentary coils are easily flexed with their respective carrier tapes.

3,906,596
COMBINED SIEVE DRUM AND TENTERING APPARATUS

Heinz Fleissner, Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

Filed Feb. 12, 1973, Ser. No. 331,471
Claims priority, application Germany, Feb. 23, 1972, 2208375; Feb. 10, 1972, 2206254; Feb. 10, 1972, 2208375
Int. Cl.² D06C *3/02, 3/06*
U.S. Cl. 26—60 **13 Claims**



1. An apparatus comprising a sieve drum device having a treatment chamber and at least one sieve drum means disposed in said treatment chamber, said sieve drum device being operatively associated with a tentering device, wherein a textile material which has been heated up uniformly over its width by passing heated air therethrough on said at least one sieve drum means within the treatment chamber of said drum device is subsequently held stretched to the desired width by said tentering device, the tentering device including a housing which is separate from the sieve drum device and which is arranged behind the sieve drum device at a distance therefrom, a tentering means disposed in said housing, and a pinning-in means for pinning the textile material to said tentering means, said pinning-in means being located near said tentering means in a pinning-in zone within said housing; means for transporting said textile material from said sieve drum device to said tentering means; duct means for surrounding the textile material on its way to said tentering means via said means for transporting said textile material, said duct means being heat-insulated and being arranged to extend from the sieve drum device to the tentering means so that the duct means, the sieve drum device, and the housing of said tentering device define a space therebetween for operating personnel; an access opening in the housing leading to said pinning-in zone, and means for sealing said opening during operation of said pinning-in means and for permitting operating personnel access to said pinning-in means during a disturbance of the pinning operation.

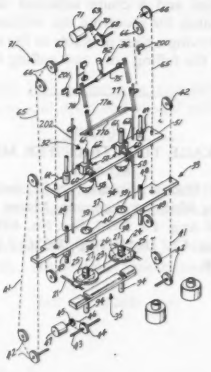
7. An apparatus comprising a sieve drum device operatively associated with a tentering device, wherein a textile material which has been heated up uniformly over its width by passing heated air therethrough on at least one sieve drum means within said drum device is subsequently held stretched to the desired width by said tentering device, the tentering device including a housing which is separate from the sieve drum device and which is arranged behind the sieve drum device at a distance therefrom and a tentering means disposed in said housing; means for transporting said textile material from said sieve drum device to said tentering means and duct means for surrounding the textile material on its way to said tentering means, said duct means being heat-insulated and being arranged between the sieve drum device and the tentering device, said tentering device including a heating section and a treatment section, and air conduits extending from the heating section to the duct means which communicates with the sieve drum device for introducing heated air from said heating section into said duct means and into said sieve drum device.

13. An apparatus comprising a sieve drum device operatively associated with a tentering device, wherein a textile material is held stretched to a desired width by said tentering device, the tentering device including a housing and a tentering means disposed in said housing, said tentering means including two laterally displaceable rows of tentering chains and a heat-insulated chamber within said housing for heat treatment of said textile material, said tentering chains extending linearly through said heat-insulated chamber and then subsequently outside said heat-insulated chamber, a cooling unit for quench-fixing the textile material held along its edges in its desired width by said tentering chains, said cooling unit comprising the sieve drum device having a sieve drum under a suction draft around which said tentering chains are wrapped before returning to said heat-insulated chamber, and means for separating said cooled textile material from said tentering chains located outside of said heat-insulated chamber.

3,906,597
CORE TRANSFER APPARATUS

Larry Dean Dellinger, Mount Holly, N.C., assignor to Technical Equipment Company of Gastonia, Inc., Gastonia, N.C.

Filed Mar. 4, 1974, Ser. No. 448,061
Int. Cl.² D01H *9/00;* **D02G** *1/20*
U.S. Cl. 28—1 R **5 Claims**



1. Apparatus for replacing the transfer core of a package having yarn wound around such core with a replacement core having a hollow center section inserted into such transfer core comprising:

a. an endless conveyor supported by a frame;
b. a transfer core removal station associated with the conveyor;
c. a plurality of spaced apart mandrels, each connected to said conveyor for supporting the package, transfer core and replacement core;
d. indexing means connected to said apparatus for sequentially indexing each of said mandrels at said transfer core removal station;
e. gripping means associated with said transfer core removal station for gripping the transfer core;
f. means for locking said yarn package against axial movement;
g. means for holding the replacement core against axial movement during removal of the transfer core comprising a split locking ring extending around the mandrel and tapered means movable upwardly interiorly of the locking ring to expand the said ring outwardly to press against the internal surface of the hollow section of the replacement core and prevent the replacement core from axial movement; and
h. pulling means associated with the gripping means for pulling the gripped transfer core from said yarn package indexed at said station;

whereby the replacement core remains in position with the yarn package around it.

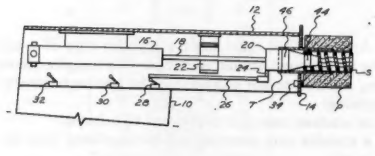
5. Apparatus for replacing the transfer core of a package having yarn wound around such core with a replacement core having a hollow center section inserted into such transfer core comprising:

a. an endless conveyor supported by a frame;
b. a transfer core removal station associated with the conveyor;
c. a plurality of spaced apart mandrels, each connected to said conveyor for supporting the package, transfer core and replacement core;
d. indexing means connected to said apparatus for sequentially indexing each of said mandrels at said transfer core removal station;
e. gripping means associated with said transfer core removal station for gripping the transfer core;
f. means for locking said yarn package against axial movement;
g. pulling means associated with the gripping means for pulling the gripped transfer core from said yarn package indexed at said station; and
h. means at the transfer core removal station for ejecting the transfer core comprising a knockout bar for striking the transfer core as it is released from the transfer core removal station and a chute adjacent the transfer core removal station for receiving the released transfer core, said chute having a slide movable in the end of said chute for striking the falling core and pulling it into the chute.

3,906,598
YARN PACKAGE TUBE TRANSFER METHOD AND MEANS

George Gordon Hacker, Stanley, N.C., assignor to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Filed Aug. 19, 1974, Ser. No. 498,265
Int. Cl.[2] D01H 9/00; D02G 1/20
U.S. Cl. 28—1 R 9 Claims

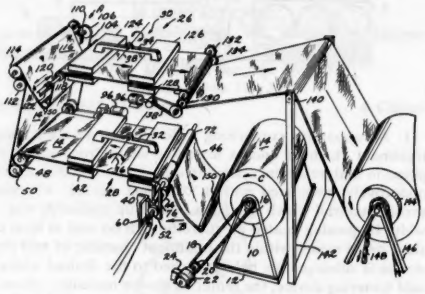


5. Apparatus for transferring a yarn package from a core tube on which it has been wound to a core suitable for supporting the package for dyeing, said apparatus comprising a plate member proportioned for endwise support of said yarn package while being apertured for clearing the core tube on which said package is wound, chuck means mounted for reciprocation perpendicularly in relation to said plate member between an initial position at which said chuck means is extended through said plate member aperture sufficiently for receiving end portions of said dye core and core tube thereover at respective spaced first and second portions thereof and retracted position at which said chuck means is withdrawn from such extension sufficiently to space it from said plate member in excess of the axial length of said core tube, said chuck means being expandable at each of said first and second portions to grip said dye core and core tube end portions interiorly when the same have been located thereover incident to placing said yarn package on said plate member, and operating means for causing said chuck means to expand at said initial position for gripping said end portions and to move between said initial and retracted positions while releasing the dye core when it has been pulled to a proper position within the yarn package for supporting the same and subsequently releasing the core tube upon complete withdrawal thereof from the package.

3,906,599
METHOD FOR PRODUCING A NEEDLED FABRIC HAVING IMPROVED FIBER ENTANGLEMENT

Alexander M. Smith, II, Elkin, N.C., assignor to The Fiberwoven Corporation, Elkin, N.C.

Continuation-in-part of Ser. No. 221,614, Jan. 28, 1972, Pat. No. 3,817,820. This application June 20, 1973, Ser. No. 371,725
Int. Cl.[2] D04H 1/46, 18/00
U.S. Cl. 28—72.2 R 26 Claims



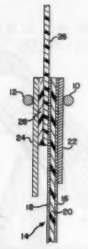
1. A method for producing a needled fabric structure having improved fiber entanglement and appearance comprising:
1. advancing a web of previously needled fibers having structural integrity to a needling zone;
2. passing the web through the needling zone with a minimum of tension in the web and uniformly needling the web with short distances between successive needle penetrations whereby successive needle penetrations involve fibers which were involved by the previous needle penetrations;
3. allowing the web to move transversely while being needled in the needling zone with the minimum tension in the web such that successive needles can penetrate into the web close to previous penetrations without deflection into the previous penetrations; and
4. continuously and non-intermittently drawing the so needled web from the needle zone whereby adverse fiber coherency and tracting characteristics of prior needled webs are substantially eliminated.

26. A method for producing a needled fabric structure having improved fiber entanglement and appearance comprising:
1. advancing a web of previously needled fibers having structural integrity to a needling zone;
2. passing the web through the needling zone with a minimum of tension in the web and uniformly needling the web with short distances between successive needle penetrations whereby successive needle penetrations involve fibers which were involved by the previous needle penetrations and at least seven needle penetrations per linear inch are performed by each needle;
3. positively oscillating the web prior to its entering the needling zone, the cycle of oscillation of the web causing decreasing translating amplitudes of the web in a forward direction throughout the entire needling zone such the successive needles can penetrate into the web close to previous penetrations without deflection into the previous penetrations; and
4. positively drawing the web from the needling zone at a point remote from the needling zone and wherein at said remote point the web has no oscillation whereby adverse fiber coherency and tracting characteristics of prior needled webs are substantially eliminated.

3,906,600
METHOD OF MAKING METALLIZED RESISTOR-CAPACITOR UNIT WITH IMPROVED INSULATION BETWEEN LEADS

Ronald Bernard Rice, Clinton, Md., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 3, 1974, Ser. No. 485,683
Int. Cl.² H01G *4/40*
U.S. Cl. 29—25.42 **4 Claims**



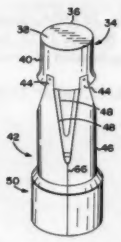
1. A method of forming a wound resistor-capacitor unit, the ends of which are not sprayed with a conductive electrode interconnecting film upon completion of said unit, and including first and second electrical leads and a first conductive foil in contact with said first electrical lead comprising aligning one end of a double-sided metallized dielectric film layer with a terminating end of said first conductive foil, inserting a dielectric film strip intermediate one side of said double-sided metallized film layer and said first conductive foil so that a relatively short portion of said dielectric film strip extends intermediate said leads to a terminating end of said dielectric film strip while the remainder of said dielectric film strip extends beyond said terminating ends of said metallized dielectric film layer and said first conductive foil, winding said leads about one another so as to form a wound resistor-capacitor unit with said first conductive foil being in contact with the side of said double-sided metallized film layer that is adjacent said dielectric film strip, cutting said double-sided metallized film layer prior to cutting said dielectric film strip, wrapping the outer extremity of said dielectric film strip around the outside of said capacitor and sealing said dielectric film strip so as to form an insulating cover layer for said resistor-capacitor unit.

3,906,601
METHOD OF FABRICATING A FAST WARM-UP PICTURE TUBE CATHODE SYSTEM

William E. Buescher, Seneca Falls, N.Y., and Donald R. Kerstetter, Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 409,041, Oct. 24, 1973, Pat. No. 3,881,124. This application Oct. 7, 1974, Ser. No. 512,479
Int. Cl.² H01J *9/02*
U.S. Cl. 29—25.14 **2 Claims**

1. A method of fabricating a fast warm-up cathode assembly for a cathode ray tube, said cathode assembly including a tubular cap having a closed end and an open end and an axial length less than its diameter; and a tubular support of low thermal conductivity for said cap, said tubular support having both ends open and having an axial length greater than its diameter, said method comprising the steps of: fabricating said tubular cap; forming said tubular support; removing given spaced areas from one end of said support to form a plurality

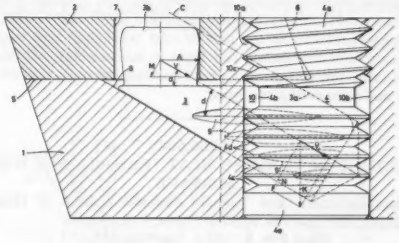


of spaced, limited area connectors; and joining the ends of said connectors to said open end of said tubular cap.

3,906,602
TOOL HOLDER FOR REVERSIBLE CUTTING ELEMENT

Pierre Kummer, Rue des Pres 20, Tramelan (Canton of Bern), Switzerland

Filed Mar. 29, 1974, Ser. No. 456,179
Claims priority, application Switzerland, Apr. 3, 1973, 4752/73
Int. Cl.² B26D *1/00*
U.S. Cl. 29—96 **6 Claims**



1. A tool holder for a plate-shaped, apertured reversible cutting element, comprising a shank with a support surface for a reversible cutting element and a hole opening into the support surface at an acute angle, in which hole a shaft of a clamping stud, a clamping head of which is engaged in the aperture of the cutting element, is displaceably guided, wherein the improvement comprises a control member which is movably mounted in the shank at one side of the shaft of the clamping stud, meshing teeth on the periphery of said control member and on the periphery of said shaft by which movement of said control member drives said shaft longitudinally, the direction of movement of the teeth on said control member being non-parallel to the axis of said shaft to produce a wedging driving action upon the teeth on said shaft, and a screw-threaded connection between said control member and said shank, for locking said control member against movement and thereby locking said clamping stud in place.

3,906,603

METHOD OF ASSEMBLING A PISTON COMPRESSOR FOR SMALL ENCASED REFRIGERATING MACHINES

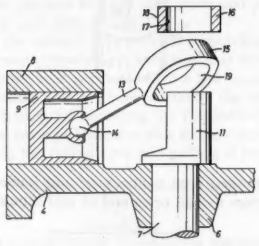
Bendt Wegge Romer, Sonderborg, and Hans Kristian Pedersen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 287,085, Sept. 7, 1972, abandoned. This application Nov. 8, 1973, Ser. No. 414,152

Claims priority, application Germany, Sept. 7, 1971, 2144650

Int. Cl.[2] B23P *15/00*

U.S. Cl. 29—156.4 R 1 Claim



1. A method of manufacturing a piston type compressor unit including a supporting member with a cylinder and a crankshaft bore having intersecting right angled axes, a piston and connecting rod assembly for said cylinder and a crankshaft for said bore, said connecting rod having a universal joint connection between said connecting rod and said piston and said crankshaft being formed with a crankpin which is cantilevered, said connecting rod further having a head defining a closed wall having an inside diameter larger than the diameter of said crankpin and a bushing fitting between said connecting rod head and said crankpin, said method comprising the steps of inserting the piston and connecting rod assembly into the cylinder, introducing the crankshaft into the crankshaft bore, utilizing said universal joint connection to tilt said connecting rod head relative to the axis of said crankshaft and thereby placing said connecting rod head in surrounding relation to said crankpin and inserting said bushing between said crankpin and connecting rod head.

3,906,604

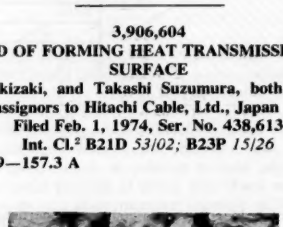
METHOD OF FORMING HEAT TRANSMISSIVE WALL SURFACE

Kimio Kakizaki, and Takashi Suzumura, both of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Japan

Filed Feb. 1, 1974, Ser. No. 438,613

Int. Cl.[2] B21D *53/02;* B23P *15/26*

U.S. Cl. 29—157.3 A 11 Claims



1. A method of forming a heat transmissive wall surface comprising the steps of forming a plurality of fine first grooves on one side of a heat transmissive wall, while forming a plurality of fine second grooves which cross said first grooves and which are substantially parallel and closely adjacent to each other, then frictionally heating by rubbing and stretching transversely the ends of the small notched ribs formed between said second grooves and fusingly connecting said ends to the adjoining ribs.

3,906,605

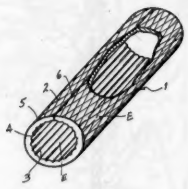
PROCESS FOR PREPARING HEAT EXCHANGER TUBE

Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 371,117, June 18, 1973, abandoned, which is a division of Ser. No. 214,034, Dec. 30, 1971, abandoned. This application May 20, 1974, Ser. No. 471,487

Int. Cl.[2] B21D *53/02*

U.S. Cl. 29—157.3 R 9 Claims



1. A process of forming enhanced heat exchanger tube having a variation in enhancement pattern comprising:

providing a metal strip of a given thickness having longitudinally extending edge portions and opposed surfaces; embossing each of said strip surfaces with a heat exchange enhancement pattern which extends only partially across the width and only partially through the thickness of the strip, said pattern having a longitudinally extending variation therein; forming said strip into the shape of a cylindrical tube with the longitudinally extending strip edges in abutting relationship by passing said strip through rolls which contact the strip surfaces adjacent the strip edges and maintain accurate alignment between said strip edges; and joining said strip edges to form a fluid and pressure tight tube with a heat exchange enhancement pattern having a variation therein corresponding to the pattern variation embossed into the strip.

3,906,606

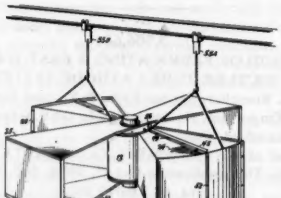
ERECTION PROCEDURE FOR VERTICAL SHAFT AIR PREHEATERS

Robert Emmett Mahoney, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,421

Int. Cl.[2] B21D *53/02;* B23P *15/26*

U.S. Cl. 29—157.3 R 6 Claims



1. The method of manufacturing a rotor for a vertical shaft rotary regenerative air preheater comprising the steps of supporting one end of a vertical rotor post in a rotatable support bearing, positioning the opposite end of said rotor post in a guide bearing that precludes lateral movement of the rotor

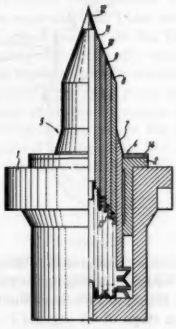
post, positioning a sector shaped element compartment radially adjacent the rotor post and attaching it thereto while substantially simultaneously attaching a similar element compartment to the rotor post 180° removed from the first rotor compartment so that there is at all times a substantially balanced assembly, and continuing to attach similar sector shaped compartments to opposite sides of said rotor post until the combined assembly of compartments comprises a composite rotor that extends concentrically around the rotor post.

3,906,607

DEVICE FOR RELATIVE ORIENTATION OF PARTS

Alexei Alexeevich Gusev, ulitsa Festivalnaya, 24, kv. 139, Moscow, U.S.S.R.

Filed Sept. 5, 1974, Ser. No. 503,325
Int. Cl.² B23P *19/00*
U.S. Cl. 29—200 P **7 Claims**



1. A device for relative orientation of parts to be concentrically positioned relative to each other and each having at least one element coaxial with respect to a common orientation center comprising: a reference surface for placing thereon the first part of a group of parts being oriented; a mandrel defining the position of the parts with respect to said reference surface and relative to each other, said mandrel comprising independent component members adjoining each other, each member being capable of independently moving along the axis of orientation of the parts which extends along the axis of the mandrel, each of said component members of the mandrel being biased in the directon towards the zone of contact with the parts being oriented and having at its leading end a portion inclined with respect to the axis of orientation, said portion being capable of cooperating with said coaxial element of the part being oriented so as to displace this part along the inclined portion until it reaches the position in which the part is oriented coaxially with the common axis of the mandrel.

3,906,608

WIRE INSERTION TOOL

Louis Donald Charron, Greely, and David Alexander Stevenson, Ottawa, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Dec. 19, 1974, Ser. No. 534,296
Int. Cl.² H01R *43/00*
U.S. Cl. 29—203 HC **4 Claims**

1. A wire insertion tool for inserting wires into a contact clip, comprising:

a barrel portion;

a cylinder in said barrel portion at a forward end thereof;

a piston slidable mounted in said cylinder;

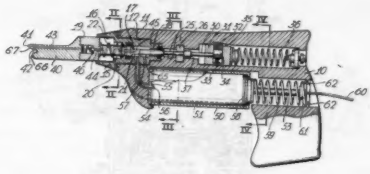
a wire inserting head mounted on a forward end of said piston;

a spring resiliently urging said piston to a forward position in said cylinder to form a chamber in said cylinder;

a port opening into said chamber in said cylinder at a position rearward of said piston when said piston is in its forward position;

means for supplying a sealant under pressure to said port;

a bore extending through said piston, an outlet from said bore positioned adjacent a cutting member on said wire



inserting head and an inlet to said bore opening to said chamber;

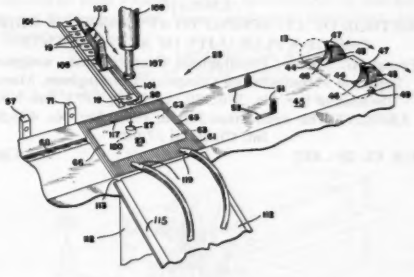
the whole so arranged that on pressure of said tool on a wire said inserting head pushes said wire into said contact clip, said piston moves rearwardly to first shut off said port opening into said chamber and to decrease the volume of said chamber whereby sealant is caused to flow through said bore from said chamber and be ejected from said outlet.

3,906,609

APPARATUS FOR MAKING DISPENSERS

Heinz F. Runge, Niles, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Division of Ser. No. 205,277, Dec. 6, 1971, Pat. No. 3,821,046, which is a continuation of Ser. No. 861,385, Sept. 26, 1969, abandoned. This application June 18, 1974, Ser. No. 480,526
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 B **3 Claims**

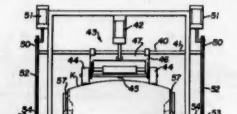


1. An apparatus for making a dispensing package having a dispensing nozzle protruding from an aperture in a strip secured to the outer package wall, said apparatus comprising means for continuously moving a procession of the packages along a predetermined path of travel, means for assuring that each of said packages has its longitudinal axis disposed in a predetermined position relative to said path of travel, means for moving a plurality of the strips in a path for intersecting with said packages, means for inserting a nozzle into projecting relationship with an aperture in each of said strips, and means for affixing one of said strips to each of said packages.

3,906,610
DE-BUNGING APPARATUS

Ernest J. Hodgetts, Spruce Grove, Canada, assignor to The Molson Companies Limited, Rexdale, Canada

Filed Oct. 25, 1974, Ser. No. 517,860
Claims priority, application Canada, Nov. 26, 1973, 186633
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—208 B 7 Claims



1. Apparatus for removing a bung from the side of a keg, said apparatus including
   a. means for cradling the keg with its central longitudinal axis disposed in a substantially horizontal plane and for rotating such a keg about said axis towards
   b. means for sensing said bung when said keg has been rotated to a first selected position;
   c. means engageable with mutually opposed ends of said keg when the latter reaches said first position, to clamp the keg so as to inhibit longitudinal movement on said cradle means; said clamping means thereupon actuating
   d. drive means for rotating said keg to a second selected position where
   e. means are located which are adapted to extract said bung, said clamping and said sensing means being moved to inoperative position upon removal of said bung and said cradling means thereafter being actuated to eject said de-bunged keg from the apparatus.

3,906,611
METHOD OF ATTACHING TO AT LEAST ONE OBJECT ONE OF A PLURALITY OF ATTACHMENTS

Francis G. Merser, Framingham Center, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

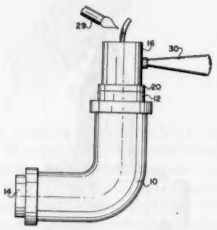
Division of Ser. No. 350,350, April 12, 1973, Pat. No. 3,850,297. This application July 8, 1974, Ser. No. 486,561
Int. Cl. B23p *17/00*
U.S. Cl. 29—417 4 Claims

1. The method of attaching to at least one object one of a plurality of attachments which are formed into a clip by having both ends thereof connected to a mounting element, said attachment comprising a filament and a pair of object-penetrating parts, one at each end of said filament, which method comprises
   a. freeing one end of said attachment ends from said clip and engaging the object-penetrating part present on said end with said object while said attachment remains secured to said clip at said other end; and
   b. thereafter freeing the other end of said attachment from said clip and engaging the object-penetrating part present on said other end with said object.

3,906,612
METHOD AND APPARATUS FOR DISASSEMBLING PLASTIC PIPE FROM PLASTIC FITTINGS WITHOUT DAMAGING THE FITTING

John Tupy, 57 N. Arch St., Johnson City, N.Y. 13790

Filed May 3, 1974, Ser. No. 466,840
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—426 6 Claims

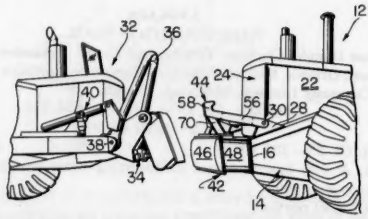


1. A method for separating plastic fittings from plastic pipe cemented therein without damaging the plastic fitting in which both the pipe and fitting are made of the thermoplastic material comprising the steps of
   a. inserting into the plastic pipe a cyclindrical heat transfer means having an outside diameter slightly smaller than the inside diameter of said plastic pipe;
   b. heating the inside surface of the plastic pipe adjacent to the area in which it is cemented to the plastic fitting with the cylindrical heat transfer means until the plastic pipe is softened;
   c. removing said cylindrical heat transfer means from the plastic pipe; and
   d. removing the softened plastic pipe from the plastic fitting.

3,906,613
METHOD OF INSTALLING A PUSH-PULL COUPLING ON A SCRAPER VEHICLE

Charles J. Chappell, and Gene R. Klett, both of Joliet, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Oct. 25, 1974, Ser. No. 517,947
Int. Cl. B60d *3/00*
U.S. Cl. 29—426 5 Claims



1. In connection with a scraper vehicle having a rearwardly mounted engine, a rearwardly extending frame portion of the

vehicle including a generally vertical mounting plate for receiving a push block assembly to facilitate engagement of the scraper vehicle by a pusher vehicle and upwardly extending radiator guards secured to the rearwardly extending frame portion by means of brackets and transversely extending pivot pins, a method of replacing the push block assembly and radiator guards with an extended push block unit and a pulling hook for employment in combination with a forwardly mounted push block and movable bail on another pusher vehicle, comprising the steps of

removing the push block assembly from the vertical mounting plate and removing the radiator guards from the brackets,

forming the extended push block unit to integrally include a push block and a longitudinally extending frame structure adapted for mounting on the vertical mounting plate and including an upper surface formed by a structural member of the frame structure,

replaceably securing the integral push block and frame extension to the vertical mounting plate,

forming the pulling hook with forwardly extending arms adapted for pivotably engagement with the respective brackets and a separate base plate arranged for engagement with the upper surface on the frame structure,

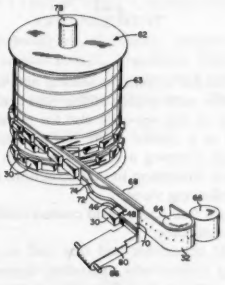
replaceably securing the forwardly extending arms of the pulling hook to the brackets by means of pivot pins, and then rigidly securing the base plate upon the upper surface of the frame structure by means of welding in order to provide structural support for the pulling hook while facilitating removal of the push block unit and pulling hook from the vertical mounting plate and brackets of the scraper vehicle.

3,906,614

METHOD OF LOADING RADIAL LEAD COMPONENTS ON PLASTIC CARRIER

Charles C. Rayburn, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 18, 1974, Ser. No. 489,777
Int. Cl.² B23P *19/02;* **B65B** *5/00*
U.S. Cl. 29—427 **10 Claims**



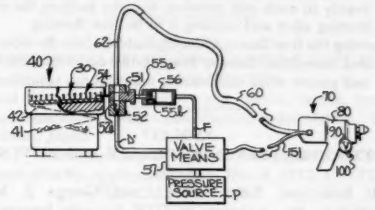
1. A method of handling a plurality of radial lead components comprising moving a plastic carrier strip past a loading station, punching openings for the leads of said components in said carrier strip, sequentially loading said components onto said carrier strip at said loading station with said leads being forced into said openings, transporting said loaded carrier to a remote location, moving said loaded strip past an unloading station at said remote location, sequentially wedging each of said components away from said carrier strip at said unloading station, gripping said wedged-away component at said unloading station and pulling it free from said carrier strip.

3,906,615

METHOD FOR FEEDING AND DRIVING TACKS

Robert L. Campbell, Jr., and Hal Lee Smith, both of Hickory, N.C., assignors to Automated Manufacturing Systems, Inc., Hickory, N.C.

Filed Sept. 19, 1973, Ser. No. 398,677
Int. Cl.² B23P *11/00*
U.S. Cl. 29—432 **4 Claims**



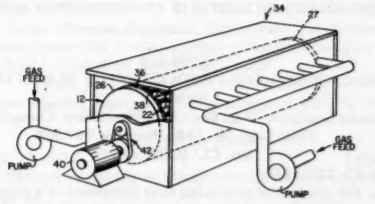
1. The improvement in a method of handling and driving into a workpiece tacks of the type having a short blunt ended shank and a relatively large head of a diameter many times greater than the diameter of any portion of the shank; said improvement comprising the steps of pneumatically conveying successive blunt ended tacks of the type described, one at a time and shank first through a flexible tube and into a passage of a tack driving gun with the leading blunt end on the shank of each successive tack serving to prevent the tack from piercing and being arrested by the wall of the flexible tube while moving the successive tacks into a tack discharge passage in the gun, aligning the shank of the tack with the axis of the discharge passage by positioning only the front surface of the head of the tack adjacent its periphery in engagement with a yieldable restraining abutment means arranged in the discharge passage, with the shank of the tack being unrestrained, so as to position the head of the tack perpendicular of the discharge passage whereby the unrestrained shank of the tack extends forwardly parallel to the axis of the discharge passage, and then applying a forward striking force to the thus positioned tack to drive the same forwardly past the abutment means and through the discharge passage into the workpiece.

3,906,616

METHOD FOR FABRICATING HONEYCOMB ROLLS

Edward T. Bryand, Saco, Maine, assignor to Metal-Tech, Inc., Biddeford, Maine

Filed Jan. 17, 1974, Ser. No. 434,015
Int. Cl.² B23K *31/02*
U.S. Cl. 29—121 A **9 Claims**



1. In a method for making honeycomb rolls of the type formed of a pair of circular end members, each having radial slots of uniform dimensions spaced around the inner periphery thereof, and a honeycomb mesh open work made from alternate strips of straight and corrugated thin metal, adjacent strips being bonded together to form integral end pieces fitting

into the slots in the end members, the improvement comprising the steps of:

bonding the end pieces by swaging them to closely controlled tolerances and inserting them into said slots to form a honeycomb roll with an axis of rotation,

encircling each end member with a strip of brazing alloy, the strip being in close proximity to the slots in which the end pieces are inserted;

slowly rotating said roll on said axis while applying heat evenly to each end member, thereby melting the strip of brazing alloy and causing it to be free flowing;

flowing the free-flowing brazing material into the slots in the end members, thereby brazing the end members to the end pieces when the brazing material has solidified.

3,906,617

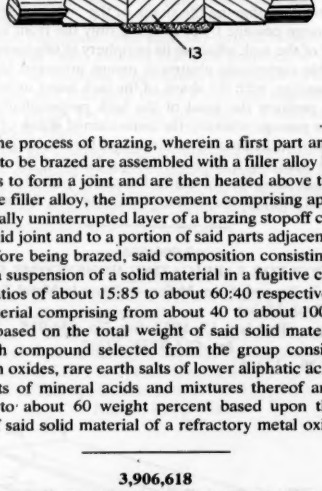
METHOD OF PREVENTING BRAZE AND DIFFUSION FLOW

Cecil Behringer, Edina, Minn., and George J. Kamin, Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 16,583, March 4, 1970, Pat. No. 3,623,921. This application May 7, 1971, Ser. No. 141,351

Int. Cl. B23k *1/04*

U.S. Cl. 228—118 **2 Claims**



1. In the process of brazing, wherein a first part and a second part to be brazed are assembled with a filler alloy between said parts to form a joint and are then heated above the liquidus of the filler alloy, the improvement comprising applying a substantially uninterrupted layer of a brazing stopoff composition to said joint and to a portion of said parts adjacent to said joint, before being brazed, said composition consisting essentially of a suspension of a solid material in a fugitive carrier in weight ratios of about 15:85 to about 60:40 respectively, said solid material comprising from about 40 to about 100 weight percent based on the total weight of said solid material of a rare earth compound selected from the group consisting of rare earth oxides, rare earth salts of lower aliphatic acids, rare earth salts of mineral acids and mixtures thereof and from about 0 to about 60 weight percent based upon the total weight of said solid material of a refractory metal oxide.

3,906,618

PROCESS FOR THE PRODUCTION OF BI-METALLIC SHEETS

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn. 06720

Filed Sept. 20, 1974, Ser. No. 507,956

Int. Cl.² B23K *19/00*

U.S. Cl. 228—118 **10 Claims**

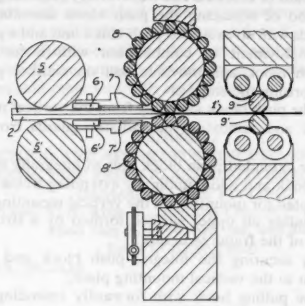
1. The process of producing strip composed of a plurality of layers of metals, by hot rolling a pack of slabs of said metals in a heavy, one-step elongation in a cyclic mill, to strip gauge, which includes the steps of:

a. assembling a pack of said slabs,

b. feeding said pack to the feed rolls of a cyclic mill at a temperature below oxidation temperature,

c. applying high intensity heat to the two outside faces of said pack, at an area upstream of said cyclic mill;

said area at which said heat is applied being at a distance from the first contact point of the work rolls of said cyclic mill, such that the interfaces between the slabs making up the pack and



which are to be bonded, do not reach oxidation temperature before said first contact point, from which point on there is no danger of oxidation.

3,906,619

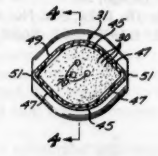
METHOD FOR SECURING CABLE PULLER CONNECTOR TO A CABLE

Frank E. Shaffer, P.O. Box 1546, Costa Mesa, Calif. 92626

Filed Oct. 4, 1973, Ser. No. 403,671

Int. Cl.² B21D *39/00;* **B23P** *11/00*

U.S. Cl. 29—517 **5 Claims**



1. A method for forming a sealing and fastening joint between a tubular cable puller of the type that is closed on one end and open on the opposite end for telescopical receipt of the free end of a coated cable having multiple individually insulated leads forming a composite cross section having a predetermined dimension in one direction, said method comprising the following steps:

inserting said free end of said coated cable in the open end of said connector;

placing said connector and free end in a die of the type including transversely extending opposed blades having concave edges which form therebetween, when in their closed positions, an opening for surrounding said connector and positioning said cable end with said predetermined dimension parallel to the direction of travel of said blades;

forcing said blades toward one another with sufficient force to cause them to swage the wall of said connector inwardly against said coating from opposite sides thereof to form a gripping ring pressing said coated cable into a cross section reducing said one dimension of said composite predetermined cross section to no more than substantially 75% of its original dimension while holding the dimension transverse thereto at substantially its original dimension.

3,906,620

METHOD OF PRODUCING MULTI-LAYER STRUCTURE

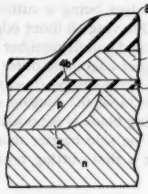
Norio Anzai, Tokorozawa; Akihiro Tomozawa; Masayasu Tsunematsu, both of Kodaira, and Yasushi Matsui, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 29, 1973, Ser. No. 410,445

Claims priority, application Japan, Oct. 27, 1972, 47-107222

Int. Cl.² B01J 17/00

U.S. Cl. 29—571 9 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:
   a. forming an insulator layer on a semiconductor substrate of a first conductivity type;
   b. selectively forming a conductor layer on a part of said insulating layer; and
   c. etching parts of said insulating layer on which said conductor layer is not formed and parts of said insulating layer underlying the peripheral edge portions of said conductor layer so that the latter portions project beyond the side portions of said insulator layer therebeneath; and
   d. introducing impurities, of a second conductivity type opposite said first conductivity type into said substrate on opposite sides of the conductor layer-insulating layer structure to form semiconductor regions of said second conductivity type in said substrate; and then
   e. converting at least said projecting portions of said conductor layer into an insulator so that said peripheral edge portions of said conductor layer are completely converted into insulators.

3,906,621

METHOD OF CONTACTING A SEMICONDUCTOR ARRANGEMENT

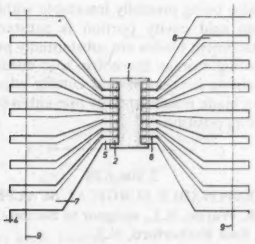
Richard Epple, Schwaigern, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Dec. 3, 1973, Ser. No. 421,166

Claims priority, application Germany, Dec. 2, 1972, 2259133

Int. Cl.² B01J 17/00

U.S. Cl. 29—591 6 Claims



1. A method of contacting a semiconductor arrangement having a plurality of spaced contact points by means of contact strips comprising: providing a coherent contact sheet having a first region which is to engage said plurality of contact points and a further region which is to extend beyond the perimeter of said arrangement; placing said first region on said plurality of contact points; connecting said first region of said contact sheet to said plurality of contact points in an electrically conductive manner; and thereafter dividing said first and second regions of said contact sheet along lines of separation which extend between said spaced contact points and completely across said first and second regions to divide said contact sheet into individual contact strips separated from each other but connected to said contact points.

3,906,622

METHOD OF MANUFACTURING WINDING TYPE FLAT MOTOR ARMATURES

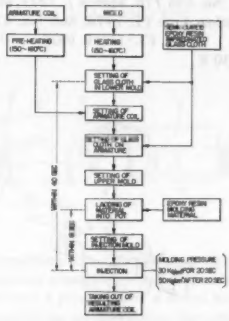
Tomiaki Sakano, Hirakata, and Naoji Takeda, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 30, 1973, Ser. No. 420,600

Claims priority, application Japan, Dec. 4, 1972, 47-122248

Int. Cl.² H02K 15/04

U.S. Cl. 29—597 7 Claims



1. A method of manufacturing an armature coil for a winding type flat motor comprising the steps of
   stacking a plurality of unit coils in layers to form an armature coil, each of said unit coils consisting of a plurality of turns of wire,
   preliminarily shaping said armature coil,
   covering said preliminarily shaped armature coil with a semi-cured resin impregnated cloth,
   placing said covered armature coil in a mold, and
   introducing a molding resin into said mold for molding said armature coil.

3,906,623

METHOD OF MAKING AN ELECTRICAL CONNECTION

Robin James Thomas Clabburn, Highworth, and Frederick William Leslie Hill, Lechlade, both of England, assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 2, 1973, Ser. No. 356,397

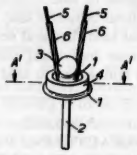
Claims priority, application United Kingdom, May 4, 1972, 20787/72

Int. Cl.² H02G 15/08

U.S. Cl. 29—628 1 Claim

1. A method of making an electrical connection comprising the steps of:
   placing a blind rivet comprising a tubular deformable member into a relatively rigid ring;
   placing an insulated portion of an electrical conductor between the inner surface of the ring and the outer surface of the deformable member; and
   expanding the tubular deformable member by drawing a nail having an enlarged head therethrough forcing the outer wall of the tubular deformable member outwardly

toward the inner surface of the ring displacing the insulation from the insulated portion of the conductor positioned therebetween thereby realizing an electrical connection between at least the conductor and the ring.



3,906,624

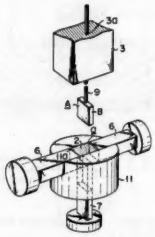
ELECTRICAL MACHINE BRUSH AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Kizo Ohta, Nishinomiya, Japan, assignor to Fuji Carbon Manufacturing Co., Ltd., Tokyo, Japan

Division of Ser. No. 338,770, March 7, 1973, abandoned. This application June 11, 1974, Ser. No. 478,363

Int. Cl.²H01R *9/00*

U.S. Cl. 29—630 E **1 Claim**



1. A method for manufacturing an electrical machine brush having a molded-in connector wire, said brush comprising a rectangular solid body, said body comprising a contacting face for contacting a moving element of an electrical circuit, a top face opposite said contacting face, and two opposed side faces having relatively large surface areas; the method comprising the steps of:

a. supplying a powdered material adapted to form the brush body into a compression chamber;

b. inserting into the compression chamber one end of the connector wire such that the connector wire is disposed through the top face of the brush when formed;

c. compressing the powdered material and the connector wire within the compression chamber by applying pressure to said side faces;

d. cutting the conductor wire to a predetermined length; and

e. ejecting the so formed brush from the compression chamber.

3,906,625

CUTTING IMPLEMENT

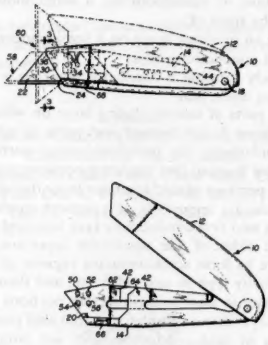
Donald Gringer, Bedford, N.Y., assignor to Allway Tools Inc., Bronx, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,456

Int. Cl.² B26B *5/00*

U.S. Cl. 30—125 **8 Claims**

1. A cutting implement comprising a sleeve-like handle member, said handle member having a cavity portion comprising a longitudinal slot, said handle member being open on the base thereof through said slot and at one end of said slot; and a carrier member pivotally mounted to said hollow sleeve-like handle member at the other end thereof opposite from said one end for pivotal movement into and out of said cavity portion, said carrier member resiliently holding within said cavity portion when said carrier member is pivotally moved into said cavity portion for substantially closing said cavity portion; said carrier member having a longitudinal extent substantially equivalent to said handle member longitudinal extent and having a plurality of studs at the end thereof opposite said pivotally mounted end adapted to support a perforated cutting blade having a top edge and a bottom edge with at least one of said edges being a cutting edge, said carrier member opposite end having an inner edge completely pivotally insertable within said handle member cavity portion longitudinal slot and an outer edge, said outer edge having a guide channel portion and being disposed on said carrier member for protecting a portion of the cutting edge of said cutting blade when said cutting blade is supported on said studs, said studs being disposed on said carrier member for supporting said cutting blade in a first cutting position with at least a portion of said cutting edge protruding through said longitudinal slot one end beyond said handle member cavity portion when said cavity portion is substantially closed by said carrier member pivotal movement into said cavity portion and with the remaining portion of said cutting edge being within said guide channel portion, said handle member longitudinal slot portion together with said carrier member guide channel portion forming a protective housing for said cutting blade remaining portion to protect said cutting blade top and bottom edges in said first cutting position; said carrier member further being formed with a resilient clip portion adapted to store and resiliently fixedly hold perforated cutting blade replacements for said supported cutting blade, said resilient clip portion also being pivotally insertable within said handle member when said cavity portion is substantially closed, whereby replacement blades are substantially prevented from movement during storage thereof in said cutting implement and the remaining portion of said cutting edge of said supported cutting blade is substantially prevented from dulling in said first cutting position.



3,906,626

DISPOSABLE SURGICAL SCALPEL

Arduino Riuli, Wayne, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Apr. 19, 1974, Ser. No. 462,320

Int. Cl.² A61B *17/32*; **B26B** *1/08, 5/00*

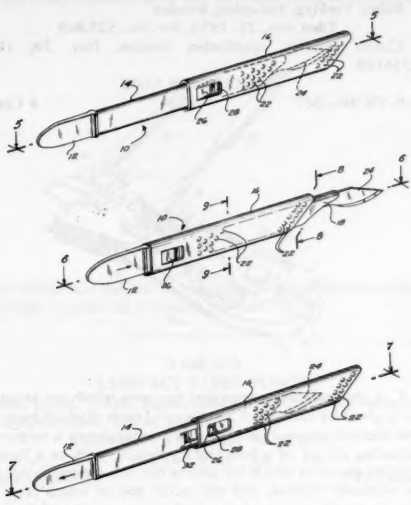
U.S. Cl. 30—162 **4 Claims**

1. A surgical scalpel which comprises,

a handle;

a cutting blade attached to said handle;

a sheath for said blade. said sheath forming a gripping surface for said handle when said blade is unsheathed; and



means for permanently sheathing said blade with said sheath.

3,906,627

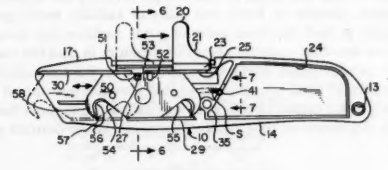
SPINNERS KNIFE

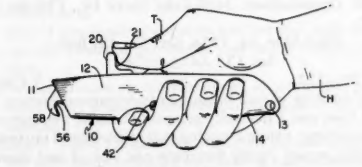
Robert E. Manning, Cumberland, R.I., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 3, 1974, Ser. No. 508,083

Int. Cl.² B26B *1/08*

U.S. Cl. 30—162 **1 Claim**





1. In a safety knife having
1. a hollow handle;
2. a guiding channel formed in the handle;
3. a blade holder securing a knife blade, the holder being mounted to slide in the channel between an extended position and a retracted position; and
4. a spring attached between the holder and the handle for biasing the holder in its retracted position;

an improved blade control thumb knob attached to the blade holder, comprising:

a. an axial beam having a "T" shaped cross section and front and rear ends, the beam's top corresponding to the top of the "T", the beam's depending height corresponding to the length of the vertical portion of the "T"; and

b. an "L" shaped thumb rest portion integral with the beam and projecting upward from the beam's top, the extent of the thumbrest's projection tapering concavely from a height at the beam's front end approximately equal to the beam's axial length to a height at the beam's rear end slightly less than one-half the beam's depending height.

3,906,628

TOOL FOR SPLITTING NUTS

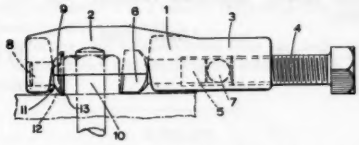
Basil Joseph Hastings, Birmingham, England, assignor to T. Williams (Drop Forging & Tools) Limited, Birmingham, England

Filed Aug. 22, 1974, Ser. No. 499,862

Claims priority, application United Kingdom, Aug. 23, 1973, 39952/73

Int. Cl.² B26B *17/00*

U.S. Cl. 30—182 **3 Claims**



1. A tool for splitting nuts comprising a rigid frame having an opening to receive a nut, an anvil at one end of the opening, and at the other end a plunger with a chisel head movable by screw means towards the anvil, wherein the cutting edge of the chisel head lies in a plane containing the axis of a nut when the tool is in position over the nut and is inclined at a small angle to that axis in such a direction that the cutting edge first engages the nut at or adjacent to its base.

3,906,629

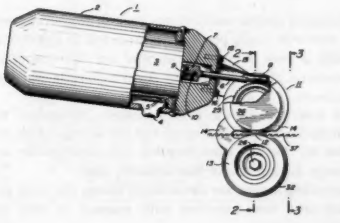
ROTARY SHEAR

Francis Joseph Fuchs, Jr., 9 University Way, Princeton Junction, N.J. 08550

Filed Nov. 11, 1974, Ser. No. 522,483

Int. Cl.² B26B *15/00, 25/00*

U.S. Cl. 30—240 **10 Claims**



1. A rotary shear for cutting material, said rotary shear comprising:

a. a handle,

b. motor means mounted within said handle,

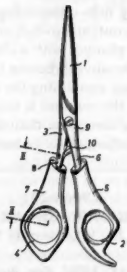
c. a shaft connected to said motor means and adapted to be rotated thereby, said shaft extending through an end of said handle,
d. a worm gear mounted to that end of said shaft extending outside of said handle,
e. a cutting head mounted to said handle adjacent said shaft,
f. a first shear wheel rotatably mounted within said cutting head and having a peripheral cutting edge,
g. the longitudinal axis of said shaft extending parallel to said first shear wheel,
h. a second shear wheel rotatably mounted within said cutting head and having a peripheral cutting edge,
i. the peripheral cutting edges of said first and second shear wheels being adapted to cooperate to cut material fed into said cutting head between the said first and second shear wheels,
j. gear means mounted to said first shear wheel and meshing with said worm gear on said shaft,
k. whereby rotation of said shaft by said motor means will rotate said first shear wheel in said cutting head.

3,906,630

SCISSORS, PARTICULARLY HAIRDRESSERS' SCISSORS

Salvatori Megna, Sacramento, Calif., assignor to "Jaguar" Stahlwaren Vertriebsgesellschaft mbH & Co., Solingen, Germany

Filed June 7, 1974, Ser. No. 477,226
Claims priority, application Germany, Apr. 10, 1974, 24174592
Int. Cl.[2] B26B *13/04*
U.S. Cl. 30—260 **10 Claims**



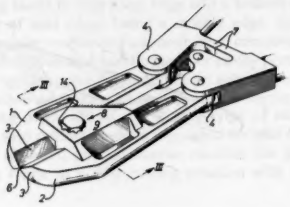
1. Scissors useful particularly by hairdressers, comprising:
a. a movable blade pivotally connected to a stationary blade with a bow member disposed on the respective stock portions of the blades to form a handle portion for the scissors,
b. at least one of the bow members being free to pivot a limited amount and mounted on a respective stock portion so that the bow member can turn within an angular range during use of the scissors, and
c. arresting means for detachably fixing the axial position of said one bow member with respect to said respective stock portion,
d. said arresting means including a plurality of indentations disposed along the axis of the stock portion and a releasably disposed detent means for engaging one of said indentations to fix the axial position of said one bow member during use of the scissors.

3,906,631

JAW ASSEMBLY FOR BOLT CUTTING DEVICES

Bengt Bruno Brunosson, Enkoping, Sweden, assignor to AB Bahco Verktyg, Enkoping, Sweden

Filed Nov. 21, 1974, Ser. No. 525,868
Claims priority, application Sweden, Nov. 29, 1973, 7316168
Int. Cl.[2] B26B *13/00*
U.S. Cl. 30—267 **4 Claims**



1. A jaw assembly comprising two jaws which are arranged to be pivotally connected together and each of which have one end thereof adapted for pivotable connection to a respective actuating device of a bolt cutting device, such as a handle-arm, by means of which the jaws of the bolt cutting device can be mutually rotated, and the outer end of which jaws are provided with cutting edges which, upon rotating of the jaws, are arranged to move toward and away from each other but not beyond each other, and the cutting edge lines of which cutting edges are positioned in one and the same plane of rotation, characterized in that the jaws are pivotally mounted about a single, common pivot means, in that each jaw on its respective side of the jaw pair in the region of the pivot means has a support flange which overlaps the adjacent jaw; in that the overlapping region of the jaws formed by their support flanges around the pivot means has on each jaw a radially inner contact surface for forming a co-acting pair of radially inner guide surfaces and two outer contact surfaces which are located at substantially equal radial distances from the pivot means, said two outer contact surfaces being arranged to co-act pairwise with the outer contact surfaces on the opposing jaw within the limits of the mutual pivoting movement of the jaws, thereby to form two pairs of radially outer guide surfaces; in that the three pairs of guide surfaces are located in three separate, parallel planes of rotation; in that the radial inner pair of guide surfaces is located in the intermediate plane of said three planes; and in that on each jaw one of the radially outer contact surfaces is located on the support flange and is depressed in relation to the radially inner contact surface.

3,906,632

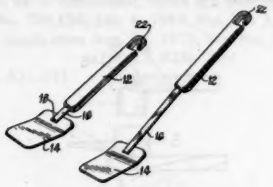
COOKING AND BARBEQUING UTENSIL

Robert H. Oppenheimer, 3410 Lake Shore Dr., Chicago, Ill. 60657

Filed Mar. 14, 1974, Ser. No. 451,040
Int. Cl.[2] A47J *43/28*
U.S. Cl. 30—322 **7 Claims**

1. In a cooking utensil having an instrumental portion for handling food and a manually graspable handle, the improvement comprising: a stem coupling said instrumental portion to said handle; means rigidly fastening one end of said stem to said instrumental portion; said handle defining an opening for slidably receiving the other end of said stem and said stem being slidable within said opening; means for limiting the outward extension of said stem to prevent its accidental removal from said handle, said slidable stem being operable to provide a cooking utensil when said stem is in a retracted position and a barbecue utensil when said stem is in an extended position, said outward extension limiting means com-

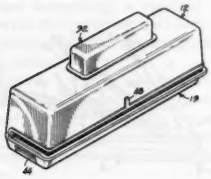
prising a shoulder communicating with said opening and a lateral flange connected to said stem and being located internally within said handle for abutment with said shoulder when said stem reaches its extended position.

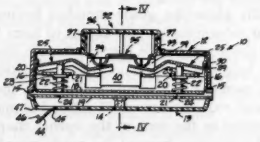


3,906,633
COMPACT PAPER PUNCH

Toshio Inoue, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan

Filed Oct. 3, 1974, Ser. No. 511,765
Int. Cl.² B26F 1/04
U.S. Cl. 30—358 **19 Claims**





1. A paper punch disposed on a longitudinal axis thereof and comprising

a pair of longitudinally spaced and parallel male dies reciprocally mounted therein for movement transverse to said axis,

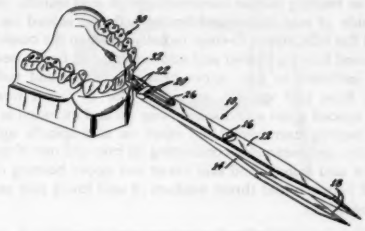
actuating means movably mounted in said paper punch for selectively engaging and reciprocating each of said male dies and

plunger means reciprocally mounted on said paper punch for selectively engaging and moving said actuating means to reciprocate said male dies simultaneously, said actuating means comprising a pair of levers pivotally mounted on a base portion of said paper punch and wherein each of said levers has a pair of offset and at least generally parallel first and second end portions, each said first end portion pivotally mounted on a respective end wall of said base portion and engaging an upper end of a respective male die and said plunger means engaging said second end portions.

3,906,634
METHOD OF MARKING ARCHWIRE WITH TOOTH WIDTH MEASUREMENTS

Thomas E. Aspel, 3149 Old Post Rd., Bonsall, Calif. 92003

Filed Dec. 19, 1974, Ser. No. 534,207
Int. Cl.² A61C 7/00
U.S. Cl. 32—14 C **2 Claims**



1. The method of marking tooth width measurements, taken from a patient's model, on an archwire, comprising:

a. providing proportional dividers and setting said dividers on a ratio of about 6.0:7.2,

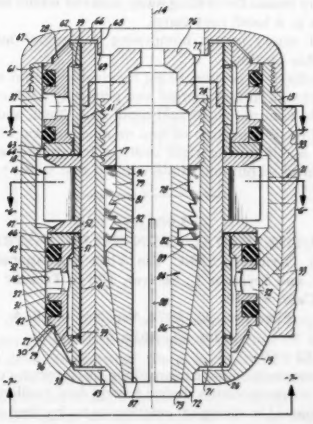
b. providing an archwire card and transferring tooth width measurements from said patient's model to said card by using said dividers in a manner increasing card measurements by said ratio, and

c. transferring card measurements from said archwire card to said archwire and marking the measurements on said archwire.

3,906,635
DENTAL HANDPIECE

Joseph P. Lares, 35 Woodhue Ct., Redwood City, Calif. 94062, and Albert J. Lares, 351 Grove St., Portola Valley, Calif. 94025

Filed Dec. 17, 1973, Ser. No. 425,540
Int. Cl.² A61C 1/10
U.S. Cl. 32—27 **1 Claim**



1. A dental handpiece comprising a housing, a lower annular shoulder within said housing and having a first radial flat face and a first cylindrical face, an upper annular shoulder within said housing and having a second radial flat face and a second cylindrical face, said flat faces being opposite each other, an air turbine rotor including a spindle, a turbine wheel disposed on said spindle near the center thereof, a lower air

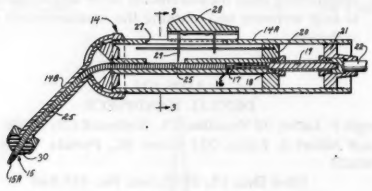
bearing carrier cooperating with said spindle on one side of said wheel and having a flange seated on said first flat face, lower O-rings radially between the outside of said lower air bearing carrier and said housing, a lower bearing sleeve included in said lower air bearing carrier and radially spaced from said spindle, a lower pair of thrust washers axially spaced apart and disposed one on and included in said lower bearing carrier and the other on said spindle against said rotor, an upper air bearing carrier cooperating with said spindle on the other side of said wheel and having a flange seated on said second flat face, upper O-rings radially between the outside of the second bearing carrier and said housing, an upper bearing sleeve included in said upper bearing carrier and radially spaced from said spindle, an upper pair of thrust washers axially spaced apart and disposed one on and included in said upper bearing carrier and the other on said spindle against said rotor, and means for conducting air into and out of spaces between said spindle and said lower and upper bearing carriers and between said thrust washers of said lower pair and of said upper pair.

3,906,636

ENDODONTIC DEVICE

William A. Rainey, 5006 Cliffwood Rd., and Donald E. Culberson, 8401 Brownsboro Rd., both of Louisville, Ky. 40222

Filed Aug. 16, 1973, Ser. No. 388,997
Int. Cl.[2] A61C *5/02*
U.S. Cl. 32—57 **12 Claims**



1. An endodontic device for removing material within and contiguous to a tooth root canal comprising:

a. rotary means for drilling away material within and contiguous to a tooth root canal,

b. said rotary means comprising a member including a flexible portion,

c. said flexible portion being receivable within said tooth root canal to flex therein and generally conform therein to the central axis of said tooth root canal, and

d. said flexible portion of said member having on its distal end a self-guiding rigid drill tip for drilling away both material within and contiguous to said tooth root canal.

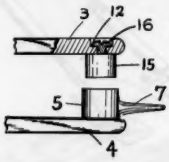
3,906,637

COMPOSITE DENTAL RESIN FILLING INSTRUMENT

Roland L. Armour, 520-C Rio Vista St., Anaheim, Calif. 92806, and Seymour L. Shriver, 108 S. Treanor St., Glendora, Calif. 91740

Filed Feb. 22, 1974, Ser. No. 444,814
Int. Cl. A61c *5/04*
U.S. Cl. 32—60 **10 Claims**

1. A composite dental resin filling instrument, comprising: a dental instrumentation device having dual resilient manipulators disposed in divergent relation to each other, a receptacle with one end open and the other closed for containing a dental resin therein being provided with a coniform dispensing tube extending outwardly from one side thereof in adjacent relation to the closed end, a circular extension of a reduced diameter projecting externally from the closed end of said receptacle, and one end of said resilient manipulators being provided with means adapted to accept said circular extension to removably support said receptacle at the closed end thereof; the other of said resilient manipulators being provided with means configured to the shape of said receptacle for insertion thereinto to force, upon manually converging said resilient manipulators together, the dental resin contained in said receptacle to the exterior thereof through said coni-



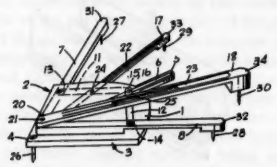
form dispensing tube in a direction along the diametrical axis of said receptacle; said receptacle together with the coniform dispensing tube thereof being adapted at the circular extension projecting from the closed end of said receptacle to rotate for conforming to the position of the dental cavity during dispensing thereinto the dental resin from said receptacle.

3,906,638

ANGLE TRISECTING DEVICE

Joseph J. Romano, East Meadow, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 3, 1974, Ser. No. 475,926
Int. Cl.[2] B43L *9/08*
U.S. Cl. 33—1 AP **3 Claims**



1. An angle trisecting device for trisecting an angle, said trisecting device comprising

a substantially plate-like guide member having two sides meeting at substantially right angles to form a corner;

a guide rod having a groove formed therein and extending along the length thereof, said guide rod extending from the guide member equiangularly between the two sides;

a pair of end rods each pivotally affixed at one end to the guide member in the area of the corner thereof and the other end extending beyond the guide member, each of said pair of rods being the same angular distance at all times from said guide rod;

a pair of struts each pivotally affixed at one end to a corresponding one of the end rods at a point equidistant from the ends of each of the end rods and pivotally affixed to each other at their other ends and movably mounted in the groove of the guide rod at their other ends;

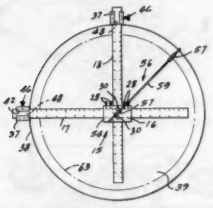
a pair of intermediate rods each pivotally affixed at one end to the guide member at the corner thereof in common with the end rods and each having a groove formed therein and extending along the length thereof; and

pivotal coupling means coupling each of the struts at a point equidistant from the ends thereof to a corresponding one of the intermediate rods in a manner whereby each pivotal coupling means is movably mounted in the groove of the corresponding one of the intermediate rods, each of the end rods and each of the intermediate rods having positioning means affixed to their other ends and the guide member at said corner having positioning means affixed thereto.

3,906,639
GEOMETRICAL MEASUREMENT DEVICES

George Wilamowski, 4818 Wegg, East Chicago, Ind. 46312

Division of Ser. No. 158,193, June 30, 1971, Pat. No. 3,805,397, which is a continuation-in-part of Ser. No. 12,286, Feb. 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 789,128, Jan. 6, 1969, Pat. No. 3,562,773. This application Aug. 22, 1973, Ser. No. 390,528
Int. Cl. B25h 7/04
U.S. Cl. 33—191 4 Claims

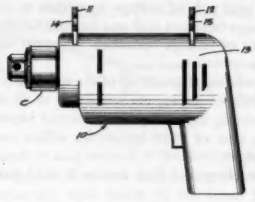


1. A measuring device comprising:
a pair of graduated scale bars having transversely extending upper face scale markings;
clamping means comprising a member having crossing recesses therein for receiving said bars and holding the bars in 90° orientation with the longitudinal axes thereof in crossing relation;
means for adjustably securing said bars in said recesses;
a gauging member longitudinally adjustably supported on the distal end portion of at least one of said bars and having an edge extending transversely across said one bar and selectively alignable with said scale markings on said one scale bar;
a contact pin extending downwardly from a lower face of said gauging member and provided with a fine line contact surface aligned with said edge and centered on the longitudinal axis of said one bar for engagement with an opposing surface on a work piece;
said gauging member being reversible on said one bar so that said contact surface can be engaged selectively alternately with an outside surface of a work piece or an inside surface of a work piece over which the device is placed for making desired measurements;
said pin having a reduced diameter threaded end portion and said gauging member having a threaded aperture located in centered alignment normal to the axis of the supporting bar and adjacent to said edge and within which said reduced diameter portion of the contact pin is removably threadedly engageable;
a trammel having means for mounting it on said clamping member and including a block and a beam bar, said block having a beam slot within which the beam is adjustably slidable;
a pair of spaced apart thumb screws threadedly mounted in said trammel block to engage the beam bar; and
a threaded hole in said trammel block centered between and parallel to said thumb screws and receptive of the reduced diameter threaded end portion of said pin when removed from said member, said reduced diameter end portion being of a length when threaded into said bore between said thumb screws to lock the beam bar in an adjusted position relative to the trammel block whereafter the thumb screws can be tightened to maintain the adjustment, and the pin then removed.

3,906,640
DRILLING ALIGNMENT DEVICE FOR ELECTRIC HAND DRILLS

Hector M. Sosa, 7311 S.W. 132 Ave., Miami, Fla. 33183

Filed Aug. 19, 1974, Ser. No. 498,260
Int. Cl.² G01C 15/00
U.S. Cl. 33—263 10 Claims

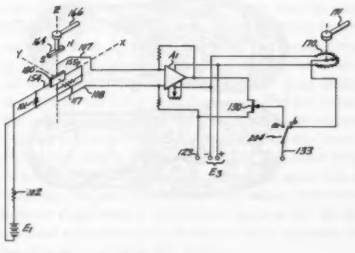


1. A drilling alignment device for electric hand drills including an electric drive motor, a housing surrounding the motor, and a drill chuck extending outwardly of the housing and driven by the electric motor for rotatively supporting a drilling tool, the combination comprising, means defining a pair of spaced, circular sighting openings attached to the motor housing, the common axis of origin of said circular openings defining a line-of-sight substantially parallel with the rotational axis of the drill chuck, the diameter of said opening nearest the outer end of a drilling tool supported by the chuck being somewhat greater than the diameter of the other opening, so that upon sighting through the smaller of said openings, reflected images of peripheral marginal portions of each of said openings will be observable.

3,906,641
AUTOPILOT EMPLOYING IMPROVED HALL-EFFECT DIRECTION SENSOR

Robert M. Freeman, Tacoma, Wash., assignor to Metal Marine Pilot, Inc., Tacoma, Wash.

Filed Sept. 27, 1971, Ser. No. 183,791
Int. Cl. G01c 17/26
U.S. Cl. 33—363 R 11 Claims



1. A direction sensor for providing a DC output voltage whose magnitude is proportional to the sine of the relative angular deviation between the orientation of a first member and that of a second member, and whose polarity is dependent on the direction of such deviation, comprising:
a. a Hall-effect device affixed to the first member, said device comprising an essentially planar wafer of material exhibiting the Hall-effect, and having first and second pairs of opposing edge surfaces, a pair of current terminals on said first pair of opposing edge surfaces and a pair of voltage terminals on said second pair of opposing edge surfaces, said pair of voltage terminals and said pair of current terminals thereby defining an null plane;

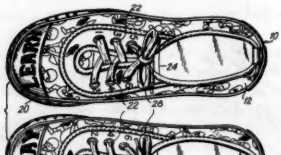
b. a source of constant DC current coupled to said pair of current terminals;
c. a permanent magnet producing a magnetic field;
d. means supporting said permanent magnet in proximity to said Hall-effect device so that said Hall-effect device is located in said magnetic field and so that said permanent magnet is rotatable with the second member;
e. means for coupling one of said pair of current terminals to one of said pair of voltage terminals to provide equal voltage drops between said one current terminal and each of said pair of voltage terminals when no magnetic field is present;
f. a linear operational amplifier of the integrated circuit type having a pair of fist inputs consisting of an inverting and a non-inverting input, a pair of second inputs for supply voltage, a pair of third inputs for offset compensation, and an output;
g. means coupling said first inputs to said pair of voltage terminals;
h. a source of a DC supply voltage having first and second terminals;
i. means coupling said first and second terminals to said second inputs;
j. a source of DC reference potential;
k. means coupling said DC reference potential to one of said first inputs;
l. adjustable resistive means connected one of said second inputs to both of said third inputs to allow adjustment of the potential appearing on said output to equal said reference potential when the first and the second members are aligned.

3,906,642

COMBINED SPORT SHOE AND EDUCATIONAL DEVICE

William J. Cohen, Randolph, Mass., assignor to CITC Industries, Inc., New York, N.Y.

Filed June 19, 1974, Ser. No. 480,879
Int. Cl.² G09B *1/00*
U.S. Cl. 35—8 R **9 Claims**



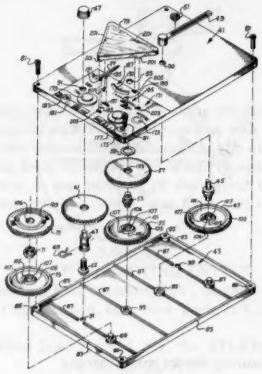
1. In combination with a sport shoe having a plurality of shoe lacing apertures and a shoelace adapted to be threaded through said lacing apertures for tying said shoe; an educational device for teaching a wearer the sequence of tying said shoe; comprising indicia on said shoe adjacent each said lacing aperture, and legend means on another portion of said shoe, said legend means including instructional directions for lacing said lace through said apertures and tying said shoe by sequential threading of said lace through said apertures in conformance with said indicia.

3,906,643

VOR INSTRUCTION DEVICE

Lonnie D. McClung, Fairbanks, Alaska, assignor to L.D.M., Inc., Fairbanks, Alaska

Continuation-in-part of Ser. No. 316,473, Dec. 19, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,900
Int. Cl.² G01C *21/00*; G09B *9/08*
U.S. Cl. 35—10.2 **19 Claims**



1. A VOR instructional device comprising:
1. a housing;
2. a VOR receiver display associated with said housing and including a to/from display, a right/left display and a course selection display;
3. an aircraft position display associated with said housing and adapted to simulate an aircraft's position along a VOR transmitter radial; and,
4. a mechanical linkage means mounted in said housing for coupling said VOR receiver display and said aircraft position display together in a manner such that:
   a. a change in the simulated aircraft position on said aircraft position display causes a change in said right-/left display and may cause a change in said to/from display; and,
   b. said course selection display can be changed to bring said right/left display to a predetermined display position and provide an indication of the VOR radial on which said simulated aircraft position lies.

3,906,644

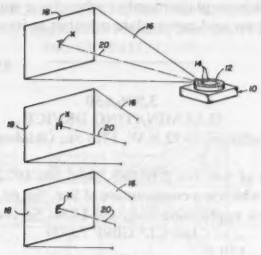
METHOD OF PRESENTING READING MATERIAL TO DYSMETRIC DYSLEXIC-IDENTIFIED CHILDREN

Harold N. Levinson, 15 Lake Rd., Great Neck, N.Y. 11020, and Jan Frank, 45 E. 82nd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 516,162, Oct. 21, 1974, abandoned. This application Jan. 6, 1975, Ser. No. 538,880
Int. Cl.² G09B *17/00*
U.S. Cl. 35—35 R **8 Claims**

1. A method of presenting reading material to a child previously identified as being dyslexic because of dysfunctioning cerebellar-vestibular circuits, which is based on the discovery that said cerebellar-vestibular dysfunction results in a subclinical eye oscillation and dysmetric ocular pursuit indicative of said condition, said method comprising the steps of preparing selectively diminished-sized units of reading material for display presentation independently of each other, arranging the aforesaid prepared units for presentation in reading se-

quence, and presenting said units, one at a time and in reading sequence, in a display position at a selected fixed location so



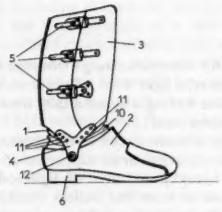
as to be read by said child, whereby the reading thereof by said child is without significant sequential scanning.

3,906,645

MOTORCYCLIST'S BOOTS

Etienne Heckel, La Walck, France, assignor to Fabrique Alsacienne de Chaussures Denu & Heckel, S.A., La Walck, France

Filed Jan. 28, 1974, Ser. No. 437,029
Claims priority, application France, Sept. 28, 1973, 73.35271
Int. Cl.² A43B *11/00*
U.S. Cl. 36—2.5 R 4 Claims



1. A motorcyclist's boot, comprising an upper made of very stiff material, a leg portion, a protective gaiter made of very stiff material and overlying said leg portion, a plurality of fastening buckles disposed on the gaiter for adjustment of the tightness thereof, a boot sole secured to said boot upper, bellows-folded flexible material disposed between and interconnecting said upper and said leg portion and extending entirely about the boot, and a pair of hinges each comprising a plate fixedly secured to the gaiter and pivotally secured to the upper on opposite sides of the boot, said hinges pivotally interconnecting the upper and the gaiter at about ankle level.

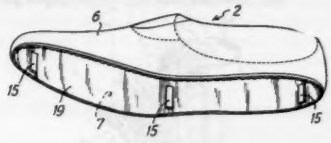
3,906,646

TRANSFORMABLE FOOTWEAR

Milio Milotic, Le Perreux, France, assignor to Milio Milotic, Le Perreux, France

Continuation-in-part of Ser. No. 413,883, Nov. 8, 1973, Pat. No. 3,849,919. This application Aug. 21, 1974, Ser. No. 499,192
Claims priority, application France, Aug. 21, 1973, 73.30327
Int. Cl.² A43B *00/00*
U.S. Cl. 36—2.5 C 6 Claims

1. A shoe which is transformable by substituting one of the elements thereof, said shoe comprising three independent elements including a one piece bottom having a wearing sole and a heel, an inner shoe assembly having an insole secured to a complete shoe lining, and an outer dressing selected from a series of dressings created for variety and having a visible upper and a lower inset portion adapted to be secured to the inner shoe assembly; and detachable connecting means for securing said bottom, insole and outer dressing together; said detachable connecting means including three thin projecting



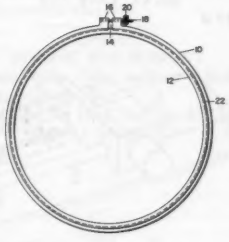
tongues secured to said bottom at the heel, waist and metatarsus respectively; the first two being directed rearwardly and the third forwardly; said insole of the inner shoe assembly having three slots formed therein for receiving the tongues of the bottom by bending the inner shoe assembly downwardly at both ends.

3,906,647

HOOP FOR EMBROIDERY AND THE LIKE

Hamilton C. Bates, Jr., Chester, Conn., assignor to C. J. Bates & Son, Inc., Chester, Conn.

Filed Oct. 31, 1974, Ser. No. 519,437
Int. Cl.² D05C *1/04*
U.S. Cl. 38—102.2 1 Claim



1. A stretching frame for holding a fabric used in embroidery, needlework, painting and the like comprising in combination: an inner ring, a split outer ring circumscribing the inner ring, means for adjusting the diameter of the outer ring relative to the diameter of the inner ring for snug embracement of the one by the other, and stop means on the inner ring defined by a peripheral flange extending radially outwardly from the upper portion of the outer side face of the inner ring and overlying the upper planar surface of the outer ring for exerting a positive grip on the fabric disposed upon the inner ring and passing over and around the stop means and between the contiguous rings with a downward tension on the fabric being increased responsively to a concomitant increase of the bite of the stop means upon the fabric.

3,906,648

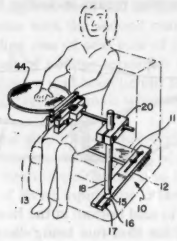
PORTABLE NEEDLECRAFT SUPPORT

Donald I. Bard, 7901 College Ln., Annandale, Va. 22003

Filed Dec. 19, 1974, Ser. No. 534,496
Int. Cl.² D05C *1/04*; A47B *23/00*
U.S. Cl. 38—102.2 7 Claims

1. A portable needlecraft stand for supporting a fancy stitchery working frame comprising a base normally located on a seat and underneath a craftsman, a slide plate having one end adjustably mounted on one end of said base, an upstanding post carried by the other end of said slide plate, the upper end of said post being disposed substantially above said slide

plate, means on said post for slidably and rotatably supporting an elongated rod and for clamping said rod in adjusted position, anchor block means fixed to one end of said rod, and means for hingedly mounting a fancy stitchery working frame



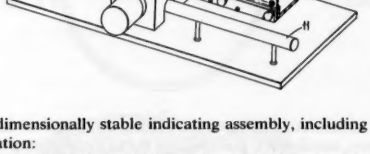
on said anchor block, whereby the working frame may be located in a position accessible to the craftsman and said working fame can be swung about said hinged mounting means to provide access to the reverse side of the material carried by the working frame.

3,906,649

DIMENSIONALLY STABLE FILM MOUNTING

Donald W. Schaefer, Lakewood, and John W. Woods, Boulder County, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,881
Int. Cl.[2] G09F *3/18*
U.S. Cl. 40—10 R **5 Claims**



1. A dimensionally stable indicating assembly, including in combination:

an elongated longitudinally extending back plate member of first material having a first dimensional expansion characteristic and having a first aperture centrally of its length and a second aperture adjacent one longitudinal end;

an elongated cover plate member facing said back plate and having one longitudinally extending edge spaced a given distance from said elongated back plate;

an elongated plate-like member having sensible indicia and a second dimensional expansion characteristic substantially different from the first dimensional expansion characteristic and a first aperture central thereof and a second aperture adjacent one longitudinal end and having a longitudinal edge portion disposed between said plate members such that said first and second apertures are aligned;

said members having substantially the same length;

retainers extending through both said first and both said second apertures, respectively;

an elongated shim means disposed between said plate members along a second longitudinal edge portion opposite to said first longitudinal edge portion, having a thickness equal to said givendistance and having a length about equal to said plate member lengths;

a plurality of fasteners evenly spaced along said length for securing said cover plate member and said shim means to said back plate member;

said cover plate member apertures being upwardly extending slots; and

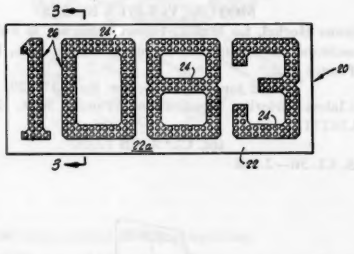
said retainers have an enlarged head portion abutting said cover plate member and resilient locking portion engaging said base plate member whereby a spring loading is exerted on said cover plate member at its said apertures.

3,906,650

ILLUMINATING DEVICE

Moody L. Coffman, 1832 N.W. 17th St., Oklahoma City, Okla. 73102

Division of Ser. No. 310,883, Nov. 30, 1972, Pat. No. 3,831,023, which is a continuation of Ser. No. 65,473, Aug. 20, 1970. This application Aug. 19, 1974, Ser. No. 498,292
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—130 B **1 Claim**



1. A sign for communicating a message to a desired location by reflection of a light from a light source comprising:

a base plate having a substantially monoplanar surface;

a light source; and

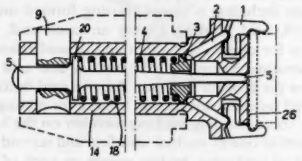
a plurality of bodies each of transparent, light transmitting medium denser than air supported on said base plate, said bodies being spaced from the light source and collectively arranged to form the indicia constituting the message, each of said bodies of transparent, light transmitting medium including a first uncoated boundary surface having one portion facing the light source and positioned in the path of light rays therefrom, whereby light rays from the source impinge upon said one portion, and further including a second, uncoated boundary surface on the opposite side of said body from said first boundary surface and non-parallel with respect to said one portion of said first uncoated boundary surface, said one portion of said first boundary surface being angled with respect to the path of travel of light rays from said light source, and with respect to said second uncoated surface, so that light from said light source is totally reflected from said second uncoated surface after passing into said transparent, light transmitting medium when said bodies and base are positioned in air, and so that no light from said light source is refracted at said second uncoated surface and transmitted through said second surface into the air, said first uncoated boundary surface further having a second portion thereof which is angled with respect to said second uncoated boundary surface so that the light rays totally reflected from the second uncoated boundary surface are refracted to a desired path through the air to said desired location, said desired path being divergent from the path of light rays from said source incident upon said one portion of said first boundary surface, said first and second uncoated boundary surfaces of each of said bodies of transparent, light transmitting medium being contiguous to, and surrounded by, said base plate.

3,906,651

CARTRIDGE CASE EXTRACTOR MECHANISM FOR FIREARMS HAVING ROTARY BREECH CLOSURE

Erkki Vesamaa, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Jan. 23, 1974, Ser. No. 435,748
Claims priority, application Finland, Jan. 26, 1973, 230/73
Int. Cl.[2] F41C *15/00*
U.S. Cl. 42—25 7 Claims



1. In a breech mechanism of a firearm, elongated bolt means having a front end region terminating in a front end face which is adapted to be engaged by the rear end of a cartridge case, said front end region having an outer surface extending circumferentially around a central axis of said bolt means and at least part of said outer surface determining the maximum radius of said bolt means at said front end region thereof, support means supporting said bolt means for linear movement along and turning movement around said axis, and extractor means carried by said bolt means at said front end region thereof for engaging and extracting a cartridge case during said linear and turning movement of said bolt means, said extractor means being situated in its entirety at a distance from said axis which is no greater than said maximum radius, said extractor means including at least one extractor member having substantially the configuration of a bell crank and including a radial arm which extends substantially perpendicularly with respect to said axis and an axial arm which extends substantially parallel to said axis forwardly beyond said front end face of said bolt means to engage the rear end region of a cartridge case, said bolt means being formed with an opening in which said extractor member is accommodated, said radial arm of said extractor member having a rear region formed with a notch, and a holding pin carried by said bolt means and having a front end extending into said notch for maintaining said extractor member assembled with said bolt means and for defining a pivot for the extractor member, said bolt means being formed with a bore in which said holding pin is situated, said bolt means also being formed with an axial bore, a striker pin situated in said axial bore, a return spring also situated in said axial bore and surrounding said striker pin, and a push ring surrounding said striker pin, situated forwardly of said return spring and engaged thereby to be urged forwardly, said holding pin having a rear end engaged by said push ring so that through the latter the force of said return spring acts on said holding pin to urge said front end thereof into said notch.

3,906,652

CARTRIDGE FEED MAGAZINE ASSEMBLY WITH SELF-CONTAINED FOLLOWER SPRING

Edgar L. Evans, 3221 Montrose Rd., St. Paul, Minn. 55119

Filed Feb. 15, 1974, Ser. No. 443,068
Int. Cl.[2] F41C *25/02*
U.S. Cl. 42—50 13 Claims

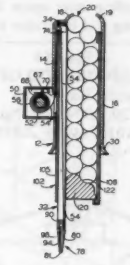
1. A cartridge feed arrangement for successively advancing each of a plurality of cartridges packaged in an original shipping container directly into a small arms weapon into position to be subsequently chambered therein, comprising,

an adapter open at both ends thereof and releasably secured within the weapon to depend therefrom for the upward insertion therein of the shipping container loaded with cartridges,

a guide plate fixed at the upper end thereof to an interior sidewall of said adapter to extend downwardly in spaced parallel relation thereto for vertical passage through the inserted cartridge container,

a follower slidably disposed in the container for supporting the cartridges thereon,

a cartridge lifter releasably secured to the depending end of said guide plate for pivotal movement into and out of lifting engagement with said follower, and



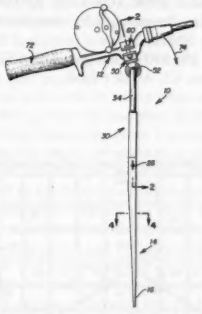
a negator spring extending from said adapter into fixed attachment with said cartridge lifter for normally biasing said lifter into vertical engagement with the depending end of said guide plate until said lifter is manually pivoted inwardly toward the depending open end of said adapter whereupon the bias of said spring is shifted to actuate said lifter upwardly in said guide plate for imparting corresponding feeding movement to said follower and the cartridges supported thereon.

3,906,653

FISHING ROD SUPPORT

Clyde M. Williams, Atoka, Okla., assignor to Reid K. Mayfield, Atoka, Okla., a part interest

Filed Jan. 30, 1974, Ser. No. 437,889
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—21.2 8 Claims



1. A fishing rod support comprising:

a rigid elongated body, a cylindrical-shaped portion formed on the lower end of said body, a pair of parallel-spaced arms on the upper end of said body, the ends of said arms being turned inward along a common axis, said ends of said arms having a cylindrical shape with the exterior of said arms forming bearing surfaces, said arms being resiliently held in parallel position, pawls formed on the inside surfaces of said arms;

a base having a cylindrical socket in the upper end thereof receiving said cylindrical portion of said body thereby allowing rotation between said body and base, means on

the lower end of said base for anchoring the base in place with said socket extending in a vertically upward direction; and

a clamp member having a cylindrical portion, sockets formed in either end of said cylindrical portion receiving said ends of said arms therein, means formed on said cylindrical portion for releasably attaching a fishing rod to said support, ratchet teeth formed on both ends of said cylindrical portion resiliently engaged by said pawls thereby allowing rotation of said clamp member about a horizontally extending axis upon the application of a force on said fishing rod in excess of a minimum.

3,906,654

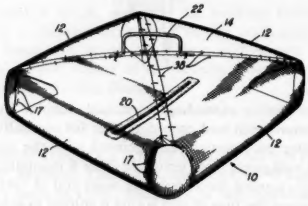
MINNOW TRAP AND METHOD OF MAKING SAME

Joel Leslie, Rt. 1, Nahunta, Ga. 31553

Filed June 20, 1974, Ser. No. 481,303

Int. Cl.[2] A01K *69/06*; **A01M** *23/08*

U.S. Cl. 43—65 **7 Claims**



1. A minnow trap comprising an enclosure having water permeable metallic wire screen walls for containing minnows; at least one water permeable metallic wire screw frusto-conical entry through which minnows may enter the enclosure; an access slot formed on one of said enclosure walls through which bait may be manually inserted into the enclosure and trapped minnows removed therefrom; zipper means for opening and closing said access slot; and a handle secured to an enclosure wall opposite said one wall.

3,906,655

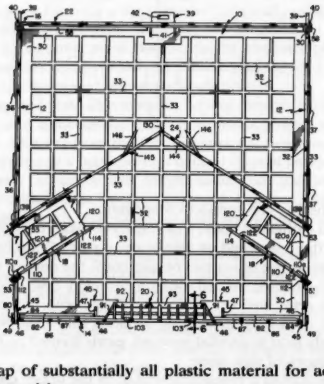
TRAP AND CAGE FOR AQUATIC ANIMALS

Walter S. Lowenthal, Jr., Freeport, N.Y., assignor to Aberdeen Industries, Inc., Bay Shore, N.Y.

Filed June 19, 1974, Ser. No. 480,632

Int. Cl. A01k *69/08*

U.S. Cl. 43—100 **12 Claims**



1. A trap of substantially all plastic material for acquatic animals comprising:

a pair of first side walls, at least one latching member formed on the top and the bottom and at least one locking means formed on each side of each said first side wall,

a pair of second side walls each having an opening formed therein, at least one latching member formed on the top and the bottom of each said second side wall and at least one locking means formed on each side of each said second side wall for cooperating and locking with a said locking means of a said first side wall,

a top, a hinged door on said top, means formed on each side of said top for mating and holding a corresponding latching member on the top of a respective one of each of said first and said second side walls,

a bottom including a raised housing formed on a portion thereof, said housing having an open end, trap door means for closing said open end of said raised housing, cooperating means on said bottom and said trap door means for holding said trap door to said bottom, means formed on each side of said bottom for mating and holding a corresponding latching member on the bottom of a respective one of each of said first and second side walls, a pair of walkways, mating means on each of said walkways and each of said second side walls for holding a said walkway to a said second side wall,

and barrier means for location within the space defined by said pairs of first and second side walls when the latter are connected together, said barrier means including a central opening, and means on said barrier means for engaging at least two of said side walls to hold the barrier means within said space located between said bottom and said top.

3,906,656

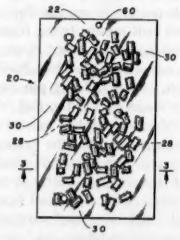
ANTI-COAGULANT BAIT PACKAGE FOR RODENTS INCLUDING METHODS OF MAKING AND USING SAME

Vincent D. Burke, 1258 Blair Ave., St. Paul, Minn. 55104, and Kendrick A. Johnson, 8242 Queen Ave. South, Minneapolis, Minn. 55431

Filed Jan. 24, 1974, Ser. No. 436,117

Int. Cl.[2] A01M *25/00*

U.S. Cl. 43—131 **13 Claims**



1. An anti-coagulant bait package for exterminating rodents comprising first and second layers, at least said first layer being of a flexible material, and a plurality of anti-coagulant bait pellets, said first layer confronting said second layer and secured thereto in areas between pellets so as to form individual compartments or cells which completely envelop said pellets, each compartment or cell containing a pellet whereby the tearing of either layer by rodents in gaining access to a particular pellet does not open and destroy the individuality of the compartments or cells containing the other pellets.

3,906,657

PEST BIRD EXTERMINATING PERCH

Robert Bosch, Box 22, Muscatine, Iowa 52761

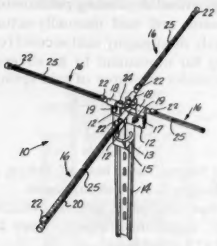
Filed Feb. 21, 1975, Ser. No. 551,730

Int. Cl.[2] A01M *25/00*

U.S. Cl. 43—131 **4 Claims**

1. A folding perch for eradication of pest birds including a bracket having a plurality of upright radially extending plates,

elongate tubular perch members, means pivotally securing one of said perch members to each of said radially extending plates of said bracket for movement of said perch from a generally horizontal position to a generally vertical position, each of said tubular perch members having an opening formed



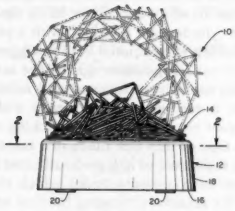
in the upper surface thereof intermediate its opposite ends, an absorbent wick mounted in said perch tube and extending upwardly through the opening therein for engaging the feet of birds, a filler neck formed on said perch tube, and means closing said filler neck.

3,906,658

MAGNETIC TOY HAVING SCULPTURABLE PARTICLES

Sam Gross, P.O. Box 1323, North Hollywood, Calif. 91604

Filed Dec. 26, 1973, Ser. No. 428,648
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—17 **9 Claims**



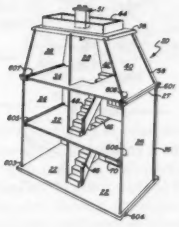
1. A moldable magnetic sculpture consisting of;
a planar base and a non-magnetic, inverted bowl-shaped cover attached to said base, and
means for providing a multi-particle sculpture that is randomly sculpturable into bridgelike designs, and that is supported by a magnetic field, said means consisting of; a magnet within said cover and having a pair of coplanar pole centers spaced apart between about 1 inch and 3 inches, said cover having a generally planar, horizontal upper surface adjacent to and parallel with the plane of said pole centers, the strength of said magnet being sufficient to produce a magnetic field intensity of between about 150 gauss and about 300 gauss at a distance of 1 inch above said cover upper surface along a centerline between said pole centers,
between about 700 and 900 individual magnetizable particles on said cover and within the magnetic field of said magnet, each particle consisting of a glazer's point having a flat, diamond-shaped configuration, said particles having a total weight of between about 50 grams and about 300 grams, said particles being sculpturable into aesthetically pleasing random designs supported by the magnetic field of said magnet, said magnet being generally U-shaped so that said particles can be supported in a bridge connecting said spaced pole centers above said cover, the upper faces of said magnet being horizontal.

3,906,659

DOLL HOUSE

Harry E. Walmer, 721 N. Overlook Dr., Alexandria, Va. 22305

Filed Feb. 14, 1975, Ser. No. 550,138
Int. Cl.[2] A63H *3/52*
U.S. Cl. 46—19 **6 Claims**



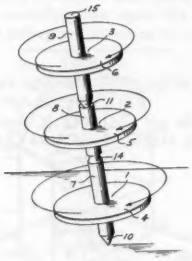
1. An easily assembled knock-down doll house, the parts of which are fitted together and held together only with pegs comprising:
a. a generally rectangular first floor member comprising left, right, and front grooves in the top surface thereof and a center groove parallel to said left and right grooves;
b. left and right side walls adapted to have their bottom edges engaged in said respective grooves of said first floor, said side walls containing a top horizontal beam member with a top inwardly slanted groove and an inward side groove, and an inner horizontal ledge member disposed between said top beam and the lower edge of said wall containing an inward side groove;
c. a front wall member adapted to have its bottom edge engaged in said front groove of said first floor, comprising vertical L-shaped side beams and a top horizontal beam member containing a top inwardly slanted groove and an inward side groove;
d. a center wall with its lower edge adapted to engage said respective groove in said first floor comprising two horizontal slots extending from the rear edge, and a forward edge having its upper portion angled inwardly;
e. identical second and third floor members comprising a stairwell in the front portion thereof containing an opening to the front edge of the floor member;
f. a roof member comprising outwardly angled left, right and front grooves and an intermediate groove parallel to said left and right grooves, said grooves disposed in the underside of said roof member, a hole through said roof member disposed through and on both sides of said intermediate groove;
g. left, right and front roof side panels each adapted to engage respective grooves in said roof member and respective top inwardly slanted grooves in said beams of said side and front walls;
h. said center wall having its top edge adapted to engage said intermediate groove in said roof;
i. said second and third floor members adapted to be inserted horizontally into respective inward side grooves of said side wall ledges and said top beam members with said stairwells engaging said slots of said center wall;
j. a plurality of pegs adapted to be inserted in holes contained in said beams, ledges and floor members at their junctures for retaining said structure together.

3,906,660

TOP TOY

Harry A. Voth, South Burnaby, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 19, 1974, Ser. No. 480,710
Int. Cl.[2] A63H *1/18*
U.S. Cl. 46—65 **1 Claim**



1. A top toy, comprising a plurality of top segments each operable as a top and each having accommodating means enabling it to spin on another while the other is spinning, each of the top segments comprising a disc type member and a stem extending substantially perpendicularly to the member through its axial center and having opposite ends, the stem of a first of the top segments having a point at one end to enable operation as a top and a point at the other end, the stem of a second of the top segments having a substantially conical depression at one end to accommodate the point at the other end of the stem of the first top segment and having a substantially conical depression at the other end, and the stem of a third of the top segments having a point at one end for accommodation in the conical depression at the other end of the stem of the second top segment.

3,906,661

ANIMATED TOY DOLL

Hal Weiser, Great Neck, N.Y., assignor to Durham Industries, Inc., Great Neck, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,488
Int. Cl.[2] A63H *11/00, 13/06*
U.S. Cl. 46—119 **10 Claims**

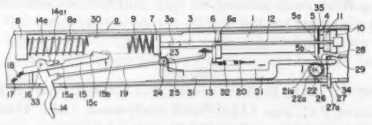
1. An animated toy comprising a doll body including a hollow torso portion, an arm and a leg mounted for pivotal movement on said torso portion and characterized in said arm being moveable between a retracted forward projecting elevated position and a depending advanced position relative to said torso portion in a downward chopping motion, said leg being moveable between a rearwardly, retracted elevated position and an advanced forwardly extended position relative to said torso portion in an upward forwardly kicking motion, spring means biasing said arm and said leg to their respective advanced positions, first retaining means adapted to releasably hold said arm cocked in its retracted elevated position against the tension of said spring means, said retaining means adapted to releasably hold said leg cocked in its retracted rearwardly elevated position against the tension of said spring means, first manually-actuatable release means for selectively disengaging said first retaining means to release said arm for movement to its advanced depending position under the force of said spring means, and said manually-actuatable release means for selectively disengaging said second retaining means to release said leg for movement to its advanced forwardly extended position under the force of said spring means.

3,906,662

TOY GUN

Kanji Suzuki, and Nagao Tada, both of Tokyo, Japan, assignors to Daishin Kogyo K.K., Tokyo, Japan

Filed Apr. 24, 1974, Ser. No. 463,589
Claims priority, application Japan, Apr. 26, 1973, 48-46762; July 24, 1973, 48-82661
Int. Cl.[2] A63H *5/04*
U.S. Cl. 46—195 **4 Claims**



1. Toy gun consisting essentially of an air cylinder having an opening at its forward end wall; a first packing means having an opening formed in conformity to said opening of said air cylinder and fixed to said air cylinder at its tip end; a piston fitted in said air cylinder and provided with a piston rod connected thereto which is associated with a trigger and adapted to be locked in a retired position against the action of spring means for urging said piston forward and released from the locked position; a second packing means with an opening which is positioned ahead of said first packing means to pass therebetween a tape of thin film made of a material having an air transmission resistance of a degree sufficient for producing a compressed air of a pressure under which the thin film is broken; means for relatively bringing the first and the second packing means into a position to press against each other, rendering said air cylinder sealed in cooperation with the tape held therebetween before the release of the piston rod; and a tape feeding means disposed in the course of the tape before a position where the snap break is effected and formed of a friction roller, gear transmission means and means associated with the piston rod and adapted to operate said gear transmission means in the course of retreat of the piston rod thereby to push the tape to feed it to said position through friction between the friction roller and the tape pressed against it.

3,906,663

METHOD AND APPARATUS FOR GROWING BEAN SPROUTS AND OTHER EDIBLE SPROUTS

Ting-Fu Peng, and Eng-Chin Peng, both of 6313 Fair Oaks Ave., Baltimore, Md.

Filed June 12, 1974, Ser. No. 478,578
Int. Cl.[2] A01C *1/00*
U.S. Cl. 47—14 **8 Claims**

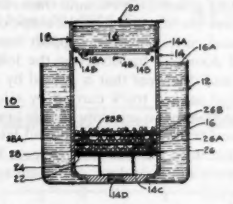
1. Self watering kit means for growing edible sprouts from seeds comprising:

a main water reservoir comprising a container open at the top end thereof;

a growth chamber comprising a container constructed of water pervious material situated in said main reservoir and open at its top end, said top end extending above the water level of said main reservoir;

a foraminous grate means mounted adjacent the bottom of said growth chamber across substantially the entire transverse cross-section thereof and spaced from said bottom in the provision of a drain cavity therebetween;

an auxiliary water reservoir comprising an open top container of water pervious material substantially closing and



engaged with the top of said growth chamber and permitting the flow of air therebetween into and out of said growth chamber;

and

at least one absorbent membrane overlying and coextensively juxtaposed with said grate means for receiving a layer of seeds for sprouting.

3,906,664

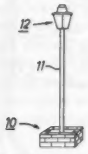
FLOWER PLANTER ASSEMBLY

Richard C. Hall, 3828 - 17th Ave. S., Minneapolis, Minn. 55407

Filed Aug. 21, 1974, Ser. No. 499,154

Int. Cl.[2] A01G *9/02*

U.S. Cl. 47—34 **5 Claims**



1. A yard light flower planter comprising a multisided base member for receiving a quantity of soil and being made of a soft plastic material with a floor and multiple vertical wall sections, said base floor having a central opening for accommodating a yard light with a slit extending therefrom to an edge of said base floor and through one of said wall sections, a multisided decor tray made of a soft plastic material with a floor and multiple vertical flange sections, said tray floor having a central opening for accommodating a yard light with a slit extending therefrom to an edge of said tray floor and through one of said flange sections, said decor tray being smaller than said base member and being supported on a quantity of soil therein in spaced relation thereto, a multisided shroud member having outer walls externally of and adjacent said base member wall section, said shroud member having flange interiorly of and adjacent said decor tray flange sections, said shroud member having a horizontally extending section connecting the upper ends of said walls thereof to said flanges thereof.

3,906,665

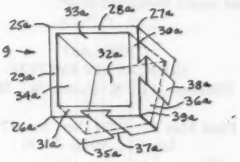
BRICK PLANTER BUILDING UNITS

Rosa M. Medlin, 2230 Bruce Ave., Columbus, Ga. 31903

Filed July 12, 1974, Ser. No. 488,018

Int. Cl.[2] A01G *9/02;* **E04B** *2/18*

U.S. Cl. 47—34.12 **7 Claims**



1. A planter brick comprising in combination circumscribing walls of brick composition defining a circumscribed space having at least an open top, one wall portion of the circumscribing walls defining on an outer surface thereof an uprightly-extending female slot having an upper open end, and spaced-therefrom another wall portion thereof defining on an exterior surface thereof a male flange extending uprightly of a size having a horizontal cross section substantially the same as the female slot, a rearward portion of the circumscribing walls having a predetermined height greater than a forward portion of the circumscribing walls, and intermediately between the rearward wall portion and forward portion there being intermediate wall portions having an upper surface thereof angled downwardly from the rearward wall portion to the forward wall portion, the circumscribing walls including a plurality of separate upright walls with adjacent upright walls extending angularly to one another interconnected with one another to define a corner, one wall portion containing the female slot separate in an upright wall apart from a male flange contained in another wall portion, each of the one wall portion containing the female slot and the other wall portion defining the male flange being each respectively one of said plurality defining said corner, and at least one of the plurality being one of the intermediate wall portions having an upper surface thereof angled downwardly.

3,906,666

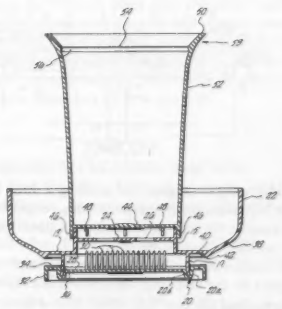
MULTI-UNIT FLORA DISPLAY ASSEMBLY

Robert H. C. M. Daenen, Erembodegem, and Pieter K. J. De Coster, Aalst, both of Belgium, assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed July 29, 1974, Ser. No. 492,805

Int. Cl.[2] A47G *7/03*

U.S. Cl. 47—34.13 **9 Claims**



1. A floral arranger comprising:

a. a bowl having a sidewall and being alternately positionable upon or under a vase and having an opening in the bottom wall thereof, said opening being bounded by an upper flange member integral with said bottom wall and extending upwardly therefrom and a lower flange member extending downwardly from said bottom wall; and,

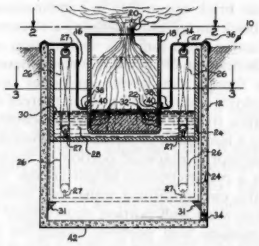
b. a vase having a recessed base and an integral sidewall, said sidewall including a lower portion releasably engaged with said upper flange member.

3,906,667

IRRIGATION SYSTEM

Earl Evan Williams, 113 S. Queen St., Shippensburg, Pa. 17257

Filed May 20, 1974, Ser. No. 471,341
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—38 **11 Claims**



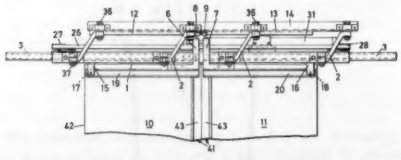
1. A constant level irrigating system comprising a support, a pot or like vessel on the support for holding a plant to be watered by the irrigating system and having a water entry opening therein, a reservoir pan surrounding the pot so that when water is placed in the reservoir pan the opening is below the surface of the water in the reservoir pan, and means interconnecting said reservoir pan and said support for automatically raising or lowering said reservoir pan as the water level in the reservoir pan changes to maintain the surface of the water at a constant level with respect to the opening despite the addition of level to or removal of water from the reservoir pan.

3,906,668

SLIDING PLUG DOOR GEAR

Edward George Simmons, Shepperton, England, assignor to PLC Engineering Company Limited, England

Filed June 6, 1974, Ser. No. 476,883
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—212 **7 Claims**



1. Sliding plug door gear for guiding a door leaf in its plugging and longitudinal movement with respect to an opening that is closable by said door leaf, said door gear comprising:

at least one door leaf to be slid;

a first stationary track that is supported stationary with respect to the opening; said first track having a generally longitudinal portion that extends in a direction across the opening and that is generally parallel to said door leaf; said first track having at one end thereof an oblique end portion, oblique to the orientation of said door leaf and said first track longitudinal portion; said door leaf being in engagement with said first track, such that movement of said door leaf longitudinally of itself is guided by said first track;

a horizontal support bar oriented generally parallel to said first track longitudinal portion;

parallelogram linkage means supported in a fixed location with respect to the opening and carrying said support bar for enabling generally horizontal transverse movement of said support bar, as caused by the shape of said first track;

an actuator carried by said support bar and connected with said door leaf for effecting the longitudinal movement of said door leaf that is guided by said first track;

a longitudinal second track carried by said door leaf; first connecting means on said support bar in engagement with said second track both vertically and laterally;

a longitudinal third track on said support bar; second connecting means on said door leaf in engagement with said third track;

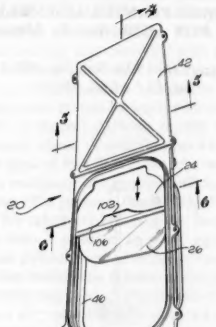
both said first and second connecting means being so disposed as to remain in engagement with the respective said second and third tracks throughout movement of said door leaf.

3,906,669

WINDOW ASSEMBLY

Xavier A. Vorguitch, Chatsworth, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Mar. 2, 1973, Ser. No. 337,747
Int. Cl.[2] E05F *11/38*
U.S. Cl. 49—372 **7 Claims**



1. A window assembly for providing access to the interior surface of a vehicle window, comprising in combination:

a main frame section and a sub-frame section mounted thereon,

said main frame section including an envelope portion,

a window shade member slideable between said main and sub-frame sections and formed of a flexible material,

means defining a first channel in said main frame section and sub-frame section, said shade member being mounted in said first channel and movable to a position in said envelope portion to visibly expose the vehicle window interior surface, said shade member being sufficiently flexible so that it is removable from said main frame section,

means defining a second channel in said main frame and spaced exteriorly from said first channel,

a flexible transparent window slidably disposed in said second channel between said shade member and vehicle window, and

means normally retaining said flexible transparent window in a fixed position in said main frame section, said flexible transparent window being deformable to permit the latter to be moved into said envelope portion thereby providing for access and exposure to the vehicle window.

3,906,670

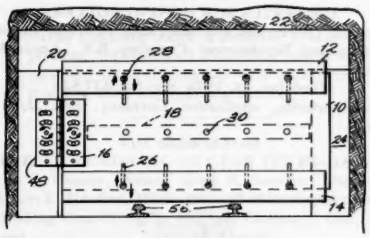
MINE VENTILATION DOOR

Willard J. Burton, Box 20, Verdunville, W. Va. 25649

Filed Mar. 20, 1974, Ser. No. 453,102

Int. Cl.² E06B *3/34*

U.S. Cl. 49—381 **6 Claims**



1. A door for attachment to an upstanding support in a mine shaft so as to provide a movable closure for said shaft and conforming substantially to the cross-sectional shape of said shaft at the point of attachment thereof, comprising:

a main rectangular closure member having adequate width to substantially span the width of a mine shaft in which it is to be suspended and having a height less than the height of said shaft;

hinge means having a first portion attached to a vertical edge portion of said closure member for relative pivotal movement in a plane parallel to said closure member and fixable in a plurality of positions within said pivotal movement so as to permit said closure member to be aligned with said cross-sectional shape of said shaft for opening and closure thereof, a second portion of said hinge means attachable to a vertical edge portion of said support so as to permit a relative pivotal movement of said closure member in a plane parallel thereto and is fixable in a desired position within said pivotal movement for suspendably securing said door to said support for swinging movement relative thereto to permit opening and closure of said door; and

at least one extension member slidably attached to a horizontal edge portion of said closure member for limited relative movement in a vertical plane parallel to said closure member so as to increase or decrease the height of said door, and fixable in a plurality of positions relative to said closure member.

3,906,671

ADJUSTABLE DOOR FRAME

Salomon Maldonado, Harlingen, Tex., assignor to Tex-Steel Corporation, Harlingen, Tex.

Filed Mar. 20, 1974, Ser. No. 452,844

Int. Cl.² E06B *1/20*

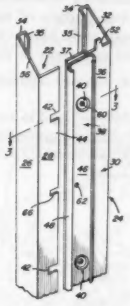
U.S. Cl. 49—505 **14 Claims**

1. An adjustable door frame, comprising, in combination:

a. first and second frame sections cooperatively arrangeable on a wall of an opening;

b. lock means for retaining the frame sections on a wall; and

c. shim means associated with the frame sections for facilitating leveling and plumbing of the frame sections on a wall, the first and second frame sections each including a longitudinally extending angle member having a pair of legs arranged extending perpendicularly from a corner, one of the legs being arranged for engaging with a corresponding leg of the other section, a pair of offset, parallel portions forming the one of the legs of one of the sections, and a clip being affixed to the outermost one of the offset



portions at a depressed area provided on the clip, with a cutout being provided in an edge of the other of the one of the legs and arranged for bracketing the depressed area, the latter allowing clearance for sliding the cutout provided edge under the clip.

3,906,672

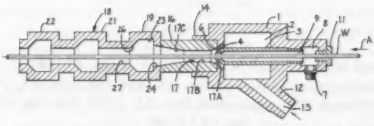
DESCALING DEVICE

Shigeharu Kobayashi, Shimotogari, Japan, assignor to Fuji Seiki Machine Works, Ltd., Shizuoka Prefecture, Japan

Filed Oct. 17, 1974, Ser. No. 515,671

Int. Cl.² B24C *3/12*

U.S. Cl. 51—8 R **5 Claims**



1. In a device for guiding an abrasive slurry along and around an elongated workpiece and for ensuring uniform impingement of abrasive particles both circumferentially and longitudinally of said workpiece, the combination comprising:

a workpiece guide for introducing a workpiece to and guiding same through said device in a predetermined position;

means defining a venturi coaxial with and axially spaced from said guide and means receiving an abrasive slurry and introducing same into said venturi;

process means defining at least one chamber coaxial with and communicating with the exit end of said venturi, said chamber having a first internal portion of diameter larger than that of said venturi and having a second portion coaxial and communicating therewith of diameter substantially less than that of first portion.

3,906,673

ABRASIVE CLEANING MACHINE

Toshiho Goto; Dan Yoshida; Akira Yamamoto, and Tatsumi Onaka, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co. Ltd., Osaka, Japan

Filed Mar. 18, 1974, Ser. No. 451,986

Claims priority, application Japan, Sept. 26, 1973, 48-112199; Mar. 20, 1973, 48-34209

Int. Cl.² B24C *3/06, 7/00*

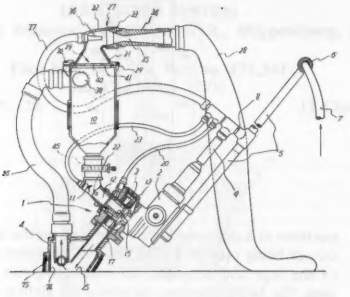
U.S. Cl. 51—9 M **15 Claims**

1. An abrasive cleaning machine comprising:

abrasive discharging means including a hood adapted to cover a given area of a surface to be cleaned;

an enclosed container for an abrasive agent, and a feed path for said agent extending from said container to said abrasive discharging means;

a return tube establishing communication between the interior of the upper portion of said container and the interior of said hood, and a bleed channel which opens to the interior of said container at the upper end thereof; and,



means for producing air currents which flow from the interior of said hood to said container via said return tube and from the interior of the container to said bleed channel whereby abrasive agent particles which are discharged against the surface to be cleaned are recirculated to said container by said air currents for re-use, said means comprising a constructed passage provided in said bleed channel, and an air nozzle for discharging pressurized air toward the downstream side of said constructed passage.

3,906,674

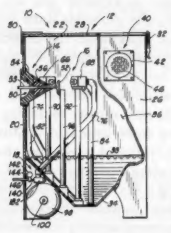
VALVE CLEANER

Lowell D. Stone, 319 N. High, Pratt, Kans. 67124

Continuation-in-part of Ser. No. 424,435, Dec. 13, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 531,917

Int. Cl.[2] B24C *3/32*

U.S. Cl. 51—12 **9 Claims**



1. An abrasive particulate material cleaning apparatus, comprising:

a. a hollow enclosure having an openable portion, a sidewall, a vent, and a hopper-like bottom portion to in use collect and store particulate material,

b. means to mount an article having a stem member extending through said sidewall, said means to mount having means constructed and adapted to in use mount an article in a cleaning zone inside said enclosure,

c. a plurality of compressed air powered particulate material dispensing nozzles mounted in said enclosure in a spaced relation, said nozzles being directed toward said cleaning zone and each having an inlet to receive particulate material from said hopper-like portion, an inlet to receive compressed air and an outlet, and

d. valve means communicably connected to said plurality of nozzles and communicably connectable to a source of compressed air, said valve means being constructed and adapted to in use control air flow through said nozzles, said cleaning apparatus being constructed and adapted to in use clean an article such as an internal combustion engine cylinder valve or an article mountable on a stem and positioned in said cleaning zone by abrasive particulate material being thrusted against the article by said nozzles.

3,906,675

APPARATUS FOR HONING ROLLERS

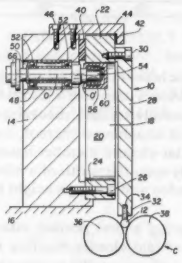
Walter Gob, Dittelbrunn, Germany, assignor to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed Jan. 28, 1974, Ser. No. 437,528

Claims priority, application Germany, Feb. 2, 1973, 2305026

Int. Cl.[2] B24B *5/14*

U.S. Cl. 51—58 **8 Claims**



1. Apparatus for making a workpiece comprising a base, a rectangular frame support having a pair of flexible longitudinal walls, a pair of substantially rigid end walls, said frame support being fixedly mounted by one of its end walls to said base to swing in the plane of said frame support relative thereto, a rocker arm mounted by one of its ends to the free end wall of said frame support, a tool held in the free end of said rocker arm, a rotary shaft extending perpendicular to the plane of said frame support and an eccentric interconnection between said shaft and one of said longitudinal walls to swing said frame support and cause said rocker arm to oscillate with respect thereto.

3,906,676

ROTARY MECHANICAL WIRE GRINDER

John Joseph Orlando, Sr., Rivervale, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed May 31, 1974, Ser. No. 475,262

Int. Cl.[2] B24B *1/00, 5/38*

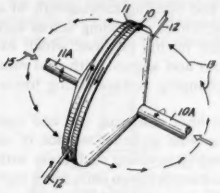
U.S. Cl. 51—112 **10 Claims**

1. A method of cleaning the surface of a wire product using a pair of grinding discs with the grinding faces thereof in parallel and faying relationship with each other and defining a wire grinding zone therebetween which comprises,

passing said wire product along its longitudinal axis substantially centrally through said wire grinding zone between and in contact with the grinding faces of said pair of discs across the diameter thereof while said discs are rotating, said discs being coaxially mounted on separate shafts, the rotary direction of one disc opposite to the other,

and then causing said pair of discs as an assembled unit to rotate about the axis of the wire product in a plane perpendicular to said wires axis while in contact with said

wire while continuously passing the wire product through the grinding zone and while maintaining said discs in grinding relationship with said wire,



whereby a twisting action is imparted to said wire during grinding between said discs such that said discs are inhibited from loading up with particulate material resulting from said grinding action.

3,906,677

GRINDING OF GEAR TEETH

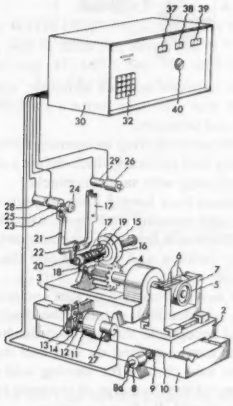
Erwin J. Gunter, Widen; Gerd R. Sommer, Dietikon, and Albert L. Friedery, Winterthur, all of Switzerland, assignors to Maag Gear-Wheel & Machine Company, Ltd., Switzerland

Filed Sept. 7, 1973, Ser. No. 395,129

Claims priority, application Switzerland, Sept. 7, 1972, 13131/72

Int. Cl.[2] B24B *3/00*

U.S. Cl. 51—123 G **5 Claims**



1. Apparatus for grinding the flanks of gear teeth on a workpiece by means of at least one grinding wheel wherein a generating motion between the workpiece and said wheel adapted to give the gear teeth involute profiles is arranged to be modified by the superimposition of relative coordinate feed displacements between said workpiece and wheel in a direction transverse to the flank of a gear tooth being ground, said apparatus comprising position transducers responsive to relative movements between the workpiece and said grinding wheel in the grinding operation for providing a measure of the relative feed positions between said grinding wheel and tooth flank, a program control unit, feed position program means in said unit, program input means in said unit for feeding a desired series of space coordinate values into said program means, input means for providing signals for said transducers to the control unit, means in the control unit for comparison of said input signals with a feed coordinate position program, said control unit having an output, and feed displacement means actuated by said output for providing corrections of said relative feed positions in accordance with the predetermined program to modify the gear tooth involute profile, whereby involuted profiles having constant or differing shape may be provided along the flank of a tooth.

3,906,678

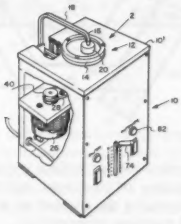
AUTOMATIC SPECIMEN POLISHING MACHINE AND METHOD

Kurt H. Roth, Mississauga, Canada, assignor to Buehler Ltd., Evanston, Ill.

Continuation-in-part of Ser. No. 289,108, Sept. 14, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,749

Int. Cl.[2] B24B *37/04, 1/00*

U.S. Cl. 51—154 **10 Claims**



1. An automatic abrading apparatus for polishing a specimen, said apparatus comprising, in combination, a generally cup-shaped member having an upper recess for containing an abrasive slurry or the like, said cup-shaped member being mounted so as to be substantially stationary, and said recess having a generally horizontal base comprising a substantially flat polishing surface having an area substantially greater than the surface area of a specimen to be polished, a drive arm extending over said recess and having an end portion engageable with a specimen disposed in said recess on said polishing surface, said drive arm being mounted for movement in any direction in a horizontal plane for moving a specimen over said flat polishing surface in rapidly changing directions and at rapidly changing speeds, drive means connected with said drive arm for actuating the latter, said drive means including a first drive member imparting a relatively high speed circular motion to said drive arm end portion, and a second drive member simultaneously imparting a relatively low speed motion to said drive arm end portion, said low speed motion being a circular progression around a major portion of the area of said polishing surface whereby the movement of said drive arm end portion is the composite of the motions effected by said first and second drive means, and loading means for producing a downward load on said drive arm end portion thereby imparting a desired vertical load on a specimen engaged therewith.

5. A method of polishing the surface of a specimen comprising the steps of supporting a specimen to be polished on the top of a stationary flat polishing surface having an area substantially exceeding the surface area of the specimen and having abrasive slurry or the like thereon, engaging the specimen from above and applying two simultaneous motions to said specimen in a horizontal plane, one motion being a relatively high speed localized circular motion and the second motion being a relatively slow circular progression or translatory motion, said second motion causing the specimen to traverse over the major portion of the area of said polishing surface, said two circular motions being superimposed upon one another to impart a composite motion to said specimen causing the latter to travel along a looping path which repeatedly crosses itself as the specimen progresses around said polishing surface, and containing substantially all of said abrasive slurry on said polishing surface throughout the polishing operation.

3,906,679

VIBRATORY FINISHING MACHINE

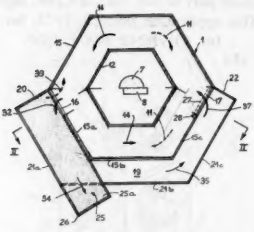
Paul Riedel, Saint Germain en Laye, France, assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Filed June 1, 1973, Ser. No. 366,036

Claims priority, application France, Mar. 12, 1973, 73.08709

Int. Cl.[2] B24B *31/00*

U.S. Cl. 51—163 8 Claims



1. A vibrator machine for surface treating a work piece and, upon the completion of treatment, sorting the ingredients of the mixture comprising the treated work pieces and the treating agents, said machine comprising:

a. an annular tank having a base which lies in a single horizontal flat plane, said tank having substantially vertical outer walls and substantially vertical inner walls forming an annular passageway;

b. a frame on which said base is mounted in spaced relationship;

c. means forming a passageway which extends substantially half way around said annular tank and to a level below the level of the base of said annular tank;

d. a vibration generator disposed with respect to said annular tank operative to move a mixture in said annular passageway in a motion comprising a continuous universal displacement along the tank and a rolling motion transverse to the displacement and to reverse the direction of displacement of said mixture;

e. a first opening in the outer wall of said annular tank on one side of said annular passageway extending upwardly from said base and communicating with said passageway of (c);

f. a second opening in an opposing outer wall of said tank extending upwardly from a point substantially above said base and communicating with said passageway of (c); and

g. a screen extending tangentially in a plane substantially coplanar with the plane of said base beneath said first opening in said passageway of (c) and projecting outwardly beyond said passageway of (c).

3,906,680

FINISHING APPARATUS WITH IMPROVED END-OF-TUB LINER AND DOOR STRUCTURE

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Continuation-in-part of Ser. No. 270,700, July 11, 1972, Pat. No. 3,831,322, which is a continuation-in-part of Ser. No. 8,815, Feb. 5, 1970, Pat. No. 3,685,213. This application Aug. 23, 1974, Ser. No. 500,163

Int. Cl.[2] B24B *31/06*

U.S. Cl. 51—163 15 Claims

1. A vibratory finishing machine, comprising:

a. a supporting frame;

b. a receptacle movably carried on said frame and adapted to receive finishing media and workpieces to be finished;

c. a vibratory drive operatively connected to said receptacle for vibrating said receptacle to impart a finishing action to workpieces in said receptacle;

d. said receptacle having sidewall portions which terminate to define an end opening of said receptacle;

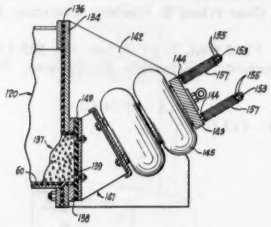
e. said receptacle additionally having mounting portions which define a mounting surface extending peripherally from said end opening substantially in a common plane;

f. an end structure extending across and closing said end opening and having portions which extend parallel to, spaced from and aligned with said mounting surface to define a clamping surface facing toward said mounting surface;

g. a resilient liner overlying the end opening in abutting relationship with an inner surface of said end structure and completely covering such inner surface as a lining to prevent contact between such inner surface and the contents of said receptacle, said liner also having peripheral portions extending continuously between said mounting surface and said clamping surface;

h. a plurality of aligned apertures formed through said mounting surface, said clamping surface and said peripheral portions; and

i. fastening means extending through said apertures supporting said end structures on said tub structure, and releasably clamping said peripheral portions of said resil-



ient liner between said tub structure and said end structure such that said liner forms a yieldable sealing mount for said end structure;

j. said end structure having an opening formed therethrough and having wall portions which define a discharge passage communicating with said receptacle;

k. said resilient liner having integral portions which extend through said opening and cover said discharge passage wall portions as a lining to prevent contact between said discharge passage wall portions and the contents of said receptacle;

l. a closure movably carried by said end structure and being movable to selectively control the discharge of contents from said receptacle through said discharge passage;

m. actuator means carried on said end structure and connected to said closure for moving said closure to selectively control the discharge of contents from said receptacle through said discharge passage;

n. whereby said closure, said actuator means and said end structure form a modular unit held in place on said receptacle by fastening means which also serve to support and peripherally clamp said resilient liner in place between said end structure and said receptacle.

3,906,681

MACHINE TOOL

William B. Seidel, Bloomfield Hills, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

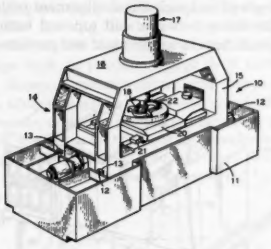
Filed Aug. 27, 1973, Ser. No. 391,089

Int. Cl. B24b *49/16*

U.S. Cl. 51—165.92 3 Claims

1. A machine tool having means for mounting a workpiece, means for mounting a machine tool in operative relationship to the workpiece, and means for effecting relative movement of the machine tool and the workpiece to shape the workpiece to a predetermined configuration, the improvement compris-

ing means for engaging the machine tool and the workpiece to effect work on the workpiece, means for continuously measuring the instantaneous work being performed by the machine tool on the workpiece, including power means directly connected with the machine tool to drive the tool at a controlled rate of rotation, the power means mounted in a housing with the housing substantially friction-lessly supported in a stationary frame forming a portion of the tool mount, a post extending from the frame, an arm radially attached to the housing cooperating with the post to restrain rotation of the housing, pressure sensitive pads positioned between the arm and post to measure the torque exerted by the machine tool on the workpiece, and means responsive to the measurement of torque to regulate the relative movement between tool and workpiece to maintain a predetermined work rate therebetween.



3,906,682

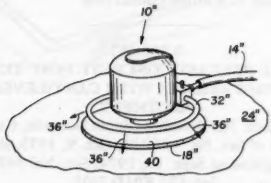
SANDER WITH DUST PREVENTION MEANS

Melvin Glasser, 568 E. 85th St., Brooklyn, N.Y. 11236

Filed Aug. 15, 1974, Ser. No. 497,733

Int. Cl.[2] B24B *23/00*

U.S. Cl. 51—170 T **1 Claim**



1. In a sander of the type having a sanding surface which is worked back and forth over a painted or similar work area preparatory to the removal of said work area surface in particulate form and having a pneumatically operated motor for powering said sanding surface, an improved means for minimizing inhalation of said removed work surface particles comprising conduit means in the form of a loop operatively arranged in encircling relation about said sander in proximate position to said work surface, said conduit means having exit openings spaced along said loop in an outwardly angular orientation in facing relation to said work surface so as to direct said pressure air along an angled path against said work surface, and conduit means for said pneumatically operated motor connected to said loop for continually flowing pressure air against said work surface during sanding service of said sander, whereby said work surface is correspondingly continually cleared of removed work surface particles before any excessive abrading thereof into lighter-than-air dust particles by said sander.

3,906,683

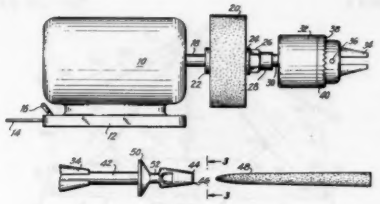
SHARPENING METHOD

Marvin I. Lepaw, 358 S. Oyster Bay Rd., Hicksville, N.Y. 11803

Filed May 24, 1974, Ser. No. 473,309

Int. Cl.[2] B24B *1/00, 3/40, 3/60*

U.S. Cl. 51—285 **5 Claims**



1. In a sharpening method, performing simultaneously on a pair of instruments or in a given sequence on one instrument one step which includes simultaneously rotating from a common source of rotational movement a grinding wheel and a work-holder while sharpening with a hand-held sharpening tool one side of a cutting edge of an instrument held by and rotating with the work-holder, and another step which includes sharpening another side of the cutting edge of the instrument while the latter is hand-held and placed at said other side of said cutting edge thereof against said grinding wheel with the latter being rotated together with the work-holder from the common source of rotational movement.

3,906,684

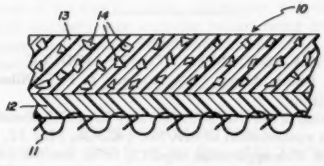
ABRASIVE ARTICLES AND THEIR METHOD OF MANUFACTURE

Charles W. Marshall, Troy; Loran A. Henderson, Elnora, both of N.Y., and William F. Zimmer, Jr., Paxton, Mass., assignors to Norton Company, Worcester, Mass.

Filed May 20, 1971, Ser. No. 145,275

Int. Cl.[2] B24B *1/00;* **B24D** *11/00*

U.S. Cl. 51—295 **25 Claims**



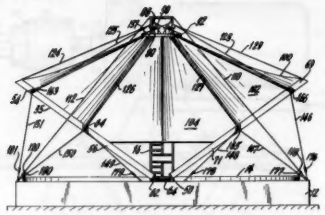
1. Abrasive material comprising a porous, compacted abrasive layer comprising particulate abrasive grains each being encapsulated in a first binder material, the encapsulated abrasive grains being distributed throughout the abrasive layer in a matrix of a second binder material, said second binder material being more resistant to distortion than said first binder material under pressure at the temperature attained during usage of an abrasive article comprising the abrasive material whereby in usage the first binder material will become heated and distorted sufficiently that said abrasive grains will be desirably shed from the abrasive layer.

3,906,685

ROOF STRUCTURE

Peter Howard, New York, N.Y., assignor to Imero Fiorentino Associates, Inc., New York, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,756
Int. Cl.[2] E04B 1/12
U.S. Cl. 52—63 12 Claims



1. A roof structure for covering at least a portion of a support surface including
a plurality of truss members;
linking means to join individual ones of said truss members end to end to form a first and a second series of linked truss members, said series of linked truss members forming a polygon arranged substantially symetrically about an axis on said surface when said truss members are in an unerected position;
anchoring means to hold each end of each of said series of linked truss members to said support surface;
a ring member arranged within and substantially coaxially with said polygon defined by said linked truss members in said unerected position;
a plurality of flexible panels having a first side connected to said ring member and the side opposite said first side connected to one of said plurality of linked truss members;
first means to raise said ring member to a predetermined height above said support surface; and
second means to raise said truss members in both of said linked series of truss members from said unerected position to an erected position at predetermined heights above said support surface so that said first and second series of truss members from respectively a first and a second arch, each of said arches sloping upwardly from said surface and outwardly from said axis from the base to the apex of said arches.

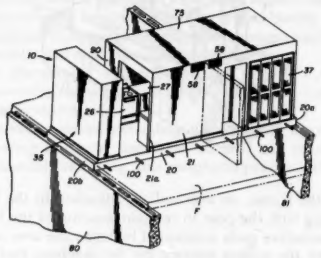
3,906,686

PRE-ASSEMBLED UTILITY MODULE

Thomas J. Dillon, Akron, Ohio, assignor to FCE-Dillon, Inc., Akron, Ohio

Continuation of Ser. No. 363,191, May 23, 1973, abandoned, which is a continuation of Ser. No. 142,526, May 12, 1971, abandoned. This application Sept. 13, 1974, Ser. No. 505,538
Int. Cl.[2] E04H 1/12; E04B 5/17
U.S. Cl. 52—79 3 Claims

1. In combination with a pair of erected and stabilized parallel, vertical bearing walls, each of which is of one-story height and each of which has a series of vertical voids extending from top to bottom thereof, with said walls being disposed in parallel relationship to each other and at predetermined spacing therebetween, the improvement comprising;
A. a self-contained, pre-assembled utility module adapted to be positioned in spanning relationship to said bearing walls, said module comprising:
1. a generally rectangular concrete slab having
a. opposed parallel end surfaces,
b. opposed parallel side surfaces,
c. opposed parallel top and bottom surfaces,
d. substantially uniform thickness
i. from said bottom surface to said top surface
ii. between said end surfaces
iii. between said side surfaces;
2. the distance between said opposed end surfaces of said slab being sufficient to permit said end surfaces of said slab to be supported on not more than half of each said bearing wall, whereby the end portion of another like slab may be positioned on the remaining half of said bearing wall in longitudinal alignment with said slab;
3. the thickness between said top and bottom surfaces being sufficient to support said end portions of said slab



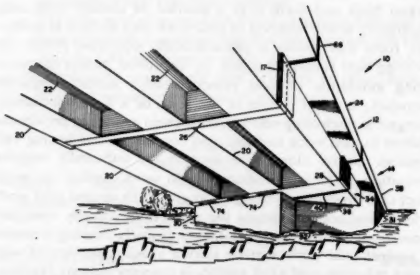
on said bearing walls in substantially perpendicular relationship therewith;
4. a full-height enclosure unit secured to the top surface of said slab and
a. being of a different material than said slab
b. having at least three vertical walls that are
i. connected to the top surface of said slab
ii. connected to each other in parallel relationship to the side and end surfaces of said slab,
c. roof means adapted to enclose the area of said slab that is surrounded by said walls;
5. said slab and said enclosure unit having adjacent portions thereof specifically contoured for interconnected reception of a utility connection.

3,906,687

SEGMENTAL PRECAST CONCRETE POST-TENSIONED OVERPASS BRIDGES WITH CANTILEVERED ABUTMENT

Morris Schupack, 300 Broad St., South Norwalk, Conn. 06901

Continuation of Ser. No. 404,156, Oct. 9, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,058
Int. Cl.[2] E01D 7/02
U.S. Cl. 52—87 16 Claims



1. Apparatus for field fabrication of a bridge span incorporating a plurality of substantially identical pre-formed longitu-

dinal beams arrayed for underlying support of a bridge deck, said apparatus comprising:

A. a spaced plurality of platform means positioned above said longitudinal beams and forming underlying support for a formed-in-place roadway portion of a bridge deck; and

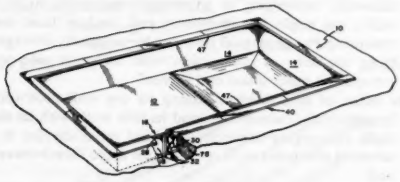
B. substantially horizontally continuous and trimmable adjustable pre-attached bridge deck supports upstandingly projecting above the tops of the longitudinal beams for engaging and peripherally supporting the spaced platform means forming the bottom portion of the bridge deck in the precise desired contoured configuration of the bridge deck, to produce bridge deck surfaces having various slopes, superelevations and warped transition surfaces while maintaining minimum required deck thickness, whereby concrete poured in place over the platform means is confined in the spaces therebetween by the supports and the beams to form a unitary roadway bridge deck of minimum design weight supported by the longitudinal beams.

3,906,688

SWIMMING POOL MODULAR CONSTRUCTION

Donald H. Witte, York, Pa., assignor to Fox Pool Corporation, York, Pa.

Filed Aug. 7, 1973, Ser. No. 386,393
Int. Cl.² E04H *12/20*
U.S. Cl. 52—152 **7 Claims**



1. A swimming pool modular wall member comprising in combination:

A. a substantially rectangular sidewall panel, said panel being provided at each end with means permitting said panel to be joined with an adjacent sidewall panel in forming a swimming pool wall, said panel being provided with hinge means one one side thereof securing at least one brace element to the outside of said panel, and

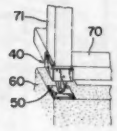
B. a brace member on said side of said panel, said brace member, comprising an upper loop and a lower loop in coplanar relationship, the two loops defining in plan a brace of generally figure-eight configuration which is pivotally attached, by coaxial linear segments of the loops on the same side thereof to said hinge means on said sidewall panel, said brace member being nested in generally parallel relation contiguous to said panel side for shipping and adapted to be pivotally extended to (in use) substantially perpendicular relationship with the panel when in use to afford external bracing support for said panel against outward pressure exerted against the side of side panel opposite said brace member.

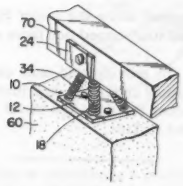
3,906,689

APPARATUS FOR ABSORBING OR DAMPING VIBRATIONS OF THE GROUND

Tadayoshi Nakayama, 2-24-10 Sekimae, Musashino, Tokyo, Japan

Filed Dec. 13, 1973, Ser. No. 424,214
Claims priority, application Japan, Feb. 8, 1973, 48-15182
Int. Cl. E04h *9/02;* **E04b** *1/98*
U.S. Cl. 52—167 **2 Claims**





1. An apparatus for absorbing a damping vibration of the ground before being transmitted to a building, comprising a main vibration damping means including a plurality of rods which are each at a lower end pivotally connected to a base secured to a foundation and at an upper end loosely fitted through a frame secured to a groundsill so as to be tilted independently of one anohter said rods being inclined upwardly and inwardly toward each other so as to converge in a vertical line, a plurality of first resilient means arranged about said rods between the base and the frame to damp mainly vertical and horizontal vibrations, and a plurality of second resilient means arranged about said rods between the frame and the upper ends of the rods to restore the rods to the respective initial inclined positions; and an auxiliary load carrying means including a frame having legs extending downwardly secured to the groundsill, and a ball supported at the lower end of the legs in rolling engagement with the foundation, said auxiliary load carrying means being arranged in juxtaposed relation with respect to said main vibration absorbing means.

3,906,690

RETRACTABLE STAIRS

Leon A. Miriani, 4095 Fruit St., Space 332, La Verne, Calif. 91750

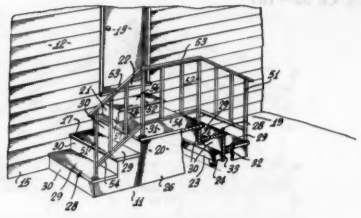
Continuation of Ser. No. 408,173, Oct. 19, 1973, abandoned. This application June 11, 1974, Ser. No. 478,253
Int. Cl.² E04F *11/04*
U.S. Cl. 52—184 **8 Claims**

1. In combination with a structure having a doorway and a space between the bottom of the structure a surface,

a stair unit positioned in centered relationship adjacent the lower edge of said doorway,

a. said stair unit comprising a stair platform having parallel front and rear faces, stair shaped side faces and an upper stoop surface, said stair shaped side faces consisting of a plurality of treads and risers ascending from the surface in stair relationship and terminating at said upper stoop surface,

one of said risers of each side surface being provided with an extension having securely affixed thereon a ground support member carrying guide rollers and support rollers for movingly supporting said stair platform,



b. a railing disposed along the upper edge formed at the juncture of said stair shaped side faces and said front face, and

c. drive means for moving said stair platform between a retracted position under the structure and an extended position adjacent the door for travel between the door and the ground surface.

3,906,691

AIRPLANE HANGAR

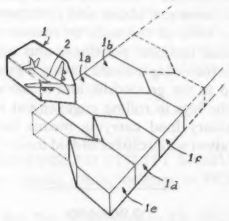
Jean-Jacques Grenet, Vigneux, France, assignor to Union de Transports Aeriens, Paris, France

Filed Oct. 10, 1973, Ser. No. 405,123

Claims priority, application France, Oct. 19, 1973, 73.37123

Int. Cl.[2] E04H *6/44*

U.S. Cl. 52—237 **7 Claims**



1. An airplane hangar comprising a plurality of construction modules which enclose airplanes, each of said modules having a plan view in the form of a first quadrilateral portion and a second triangular extension portion having a common side with said quadrilateral portion, said extension portion being inserted between the extension portions of two other adjacent similar modules, said hangar including a first row of said modules located side by side, each module connected to the next module by one of the sides of said quadrilateral portion, and a second identical row of said modules located opposite said first row with triangular extension portions of said modules of said second row inserted between the corresponding triangular portions of said modules of said first row to form a hangar of zigzag shape.

3,906,692

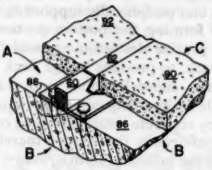
DIVIDER STRIP AND METHOD OF USING

Mario J. Boiardi, Cleveland Heights, Ohio, assignor to Boiardi Products Corporation, New York, N.Y.

Filed July 20, 1973, Ser. No. 380,964

Int. Cl.[2] E04F *15/12*

U.S. Cl. 52—318 **4 Claims**



1. In a floor structure of the type including at least one elongated seam area therein formed by at least two elongated generally U-shaped dividers each having a top wall, a pair of spaced apart side walls outwardly extending from said top wall and a mounting flange disposed adjacent the distal end of at least one of said walls so as to extend outwardly therefrom with said two dividers being disposed in an end to end abutting relationship with said mounting flanges being disposed on the same side of said seam area, a joint for positively locating said dividers relative to each other, said joint comprising:

said two dividers including closely interfitting means thereon at the abutting ends thereof for preventing undesired movement of said dividers relative to each other in the directions generally normal to said bottom wall and said side walls,

one of said dividers having its side walls protruding longitudinally outward beyond its top wall with each of the sidewalls converging to a terminal end point so as to define an angle therebetween; and, said at least one mounting flange of said one divider angularly diverging from the area of connection with said one side wall toward the outer distal end thereof;

the other of said dividers having its top wall protruding longitudinally outward beyond its side walls with its side walls converging inwardly into said other divider to a terminal end point so as to define an angle therebetween; and

said at least one mounting flange angularly diverging from the area of connection with said one side wall toward the outer distal end thereof, the corresponding locating means of said one and said other dividers being closely received against each other when said dividers are in an end to end abutting relationship.

3,906,693

OUTER WALL INSULATION SYSTEM

Mile S. Todorovic, 15 Martin St., Paterson, N.J. 07501

Filed Mar. 22, 1974, Ser. No. 453,946

Int. Cl.[2] E04B *1/74*

U.S. Cl. 52—404 **2 Claims**

1. An exterior wall system intended to insulate the exterior surface of a heated structure, comprising:

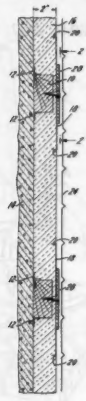
a. an exterior wall surface;

b. a plurality of spacing blocks fixedly secured to said exterior wall surface;

c. a quantity of insulating material disposed between said spacing blocks;

d. a plurality of securement means, each respectively secured to the surfaces of said spacing blocks opposite to that surface which is secured to said exterior wall surface, said securement means comprising a plurality of elongated planar brackets laterally extending beyond contact with said blocks, said brackets having flanges at the ends thereof, said flanges extending inwardly toward said exte-

rior wall surface thereby contacting and imbedding in said insulating material to hold said material in position adjacent said exterior wall surface; and



e. a constructional siding medium placed over said bracket and said insulating material so as to form an aesthetically pleasing ultimate exterior surface to the heated structure.

3,906,694

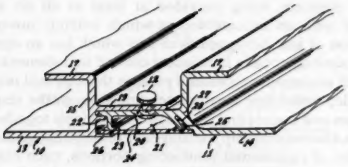
BLIND, RIVETED JOINT FOR PANEL MEMBERS

Theodor C. Schubach, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Aug. 14, 1974, Ser. No. 497,457

Int. Cl.[2] E04C *1/34;* **E04D** *1/36*

U.S. Cl. 52—471 **10 Claims**



1. A blind, riveted joint wherein a row of rivet heads are recessed in a groove provided along a joint connecting two strakes in a sidewall of a transit vehicle, said joint comprising: a cover strip of a width to span such groove,

strake material defining a recess along one side of such groove for receiving and retaining one edge of the cover strip,

strake material defining an outwardly open, inwardly inclined slot along the other side of such groove,

a deformable locking element integral with and extending inwardly from the inward side of the cover strip, said deformable element being so shaped and located that with said one edge of the cover strip in such recess, the free end of the locking element is positioned to enter such slot upon the application of external pressure to the cover strip over the locking element, and in a direction substantially normal to the outer surfaces of the strakes, the strake material defining such slot being so shaped as to deform the locking flange against withdrawal when the latter is forced into the slot, and

means for forcing the deformable element into such slot.

3,906,695

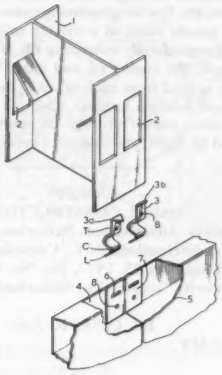
PARTITIONS

Thomas Albert Pilgrim, Nottingham; David Ernest Cuin, Radcliffe-on-Trent, both of England; Colin John Wightman, Burlington, and John Leslie Donovan, Hornby, both of Canada, assignors to BPB Industries Limited, London, England

Filed Apr. 22, 1974, Ser. No. 462,703

Int. Cl.[2] E04B *2/58*

U.S. Cl. 52—489 **20 Claims**



1. A partition system comprising a plurality of panels, and wherein each panel is provided with a plurality of generally hook-shaped clips each of which has one end secured to the panel and another end resiliently engageable and disengageable with a supporting member defining a lead portion for facilitating engagement with the respective supporting member and a clipping portion for releaseably securing the clip to the supporting member, and a tail portion for attaching the clip to a panel, the supporting member defining slots for receiving said clips.

3,906,696

PROFILED PANEL FOR THE CLADDING OF WALLS, CEILINGS, ROOFS AND THE LIKE

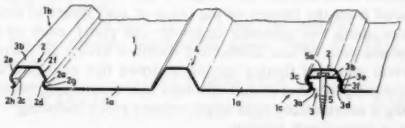
Hans Poter, Voerde; Niederrhein, and Christian Schroder, Mehrhoog, both of Germany, assignors to Armco GmbH, Unternehmemshereich Armco-Eurotec, Germany

Filed Jan. 23, 1974, Ser. No. 435,646

Claims priority, application Germany, Oct. 18, 1973, 2352309

Int. Cl.[2] E04D *3/35, 3/363*

U.S. Cl. 52—536 **19 Claims**



1. A panelling combination for the cladding of walls, ceilings, roofs or the like comprising at least a pair of generally identical panels, each panel having a generally planar main panel portion having a pair of transversely spaced longitudinally extending side portions, first and second longitudinally extending ribs one along first and second ones of said longitudinally extending side portions of each panel, each of said first and second ribs as viewed in transverse cross section being of a generally inverted U-shaped configuration each defined by a pair of legs and a bight therebetween, each pair of legs having at least lower leg portions which diverge away from

each other in a direction away from their associated main panel portion and toward their respective bight, each of said first and second longitudinally extending ribs of each panel being of a predetermined height as measured between their associated bight and their associated main panel portion, the height of each first longitudinally extending rib being greater than the height of each second longitudinally extending rib of each panel the divergent relationship of each rib of each panel is effected by at least one lower leg portion of each pair of legs being disposed at an angle other than normal to said main panel portion, the first longitudinally extending rib of a first of said pair of panels being in overlying snap engagement with the second longitudinally extending rib of the second of said pair of panels, the bights of said snap engaged ribs being substantially spaced from each other to define a gap therebetween, at least a single fastener having a head and a shank, said shank being passed through an aperture of said second panel second rib bight, and said head being housed in said gap.

3,906,697

PANEL CONSTRUCTION

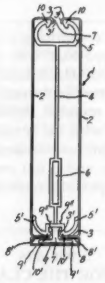
Willem Rijnders, Alblasserdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

Filed May 25, 1973, Ser. No. 363,967

Claims priority, application Netherlands, May 29, 1972, 7207264

Int. Cl.[2] E04C 2/40

U.S. Cl. 52—619 **2 Claims**



1. An elongated panel comprising two elongated facing sheets, at least one connecting member for holding said sheets in substantially parallel planes on opposite sides of said connecting member, a pair of opposed flanges along opposite edges of each of said sheets, the opposed flanges of each of said sheets being springable apart to receive said connecting member therebetween and to retain said sheets in place on opposite sides thereof, the flanges of each of said sheets being spaced from the flanges of the other of said sheets to define a slot along two opposite edges of said panel, each of the opposite ends of said connecting member having an opening therein and said flanges having inturned lips engaging said connecting member at said openings, said connecting member being a substantially rigid single unitary piece including:

a. a central web portion,

b. integral opposite end portions extending from said web portion,

c. each of said end portions having a pair of arms extending integrally from said web portion, each of said arms having a terminus opposed to and spaced from the terminus of the other arm of the same pair to define said openings,

said inturned lips engaging said termini of said arms, said central web portion having an opening therethrough, said opening in said web having a margin thereof adjacent to at least one of said end portions, said opening in said web having an entry and an exit, and said exit being spaced from said entry in a direction parallel to the length of said elongated panel.

3,906,698

ORNAMENTAL GRILLE

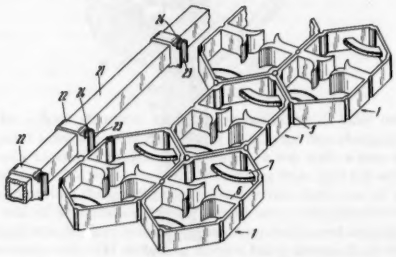
Wilfried Oepping, Krichlengern, Germany, assignor to Kunststoff GmbH, Herford, Germany

Filed Oct. 24, 1973, Ser. No. 411,590

Claims priority, application Germany, Oct. 26, 1972, 2252553

Int. Cl.[2] E04C 2/42; E04B 1/38

U.S. Cl. 52—663 **15 Claims**



1. An ornamental grille, comprising a plurality of adjacent hexagonal grille frame elements located in a common plane, each of said grille frame elements consisting of a hexagonal wall composed of two opposite parallel lateral wall portions of predetermined length located at a distance from each other which is equal to said predetermined length, and two pairs of end wall portions at the opposite ends of said opposite parallel lateral wall portions, the end wall portions of each pair being of equal length and inclined towards each other and forming a right angle with each other, each of said hexagonal grille frame elements being provided at least at all six corners thereof with an arcuate recess which extends inwardly in direction of said hexagonal wall and which has an open side facing similar recesses in adjacent ones of said elements defining with said similar recesses a passage through said ornamental grille; connecting means extending through the respective passages and connecting said adjacent elements together in an interlocked relationship forming said ornamental grille; and a plurality of ornamental reinforcing portions, each extending between respective ones of said adjacent end wall portions and reinforcing the latter, said reinforcing portions providing different aesthetic appearances depending upon the ways in which said frame elements are interlocked.

3,906,699

WATER SEALING COMPONENT FOR INSTALLING SIDING

Robert Leddy, 35 Dale Ct., Norwood, N.J. 07648

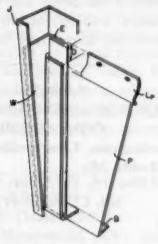
Filed Dec. 3, 1974, Ser. No. 529,090

Int. Cl.[2] E04D 3/36, 3/38; E04F 13/00

U.S. Cl. 52—712 **3 Claims**

1. A component for making rigid water-tight vertical seams in installations of siding material, said component comprising a body, said body being reversely bent upon itself to define an elongated slot in said body for slideably receiving a siding panel, said slot terminating at one end in a flange which is substantially at right angles to the length of said slot and said body and having a width substantially the same as the thickness of the butt of said siding panel, said body being further bent to define a wall at substantially right angles to the por-

tions of said body defining said slot and extending in a direction opposite from said flange said wall tapering from its



smallest width at the flange, end of the said body to its largest width at the opposite end of said body.

3,906,700

FLOATING TANK ASSEMBLING METHOD

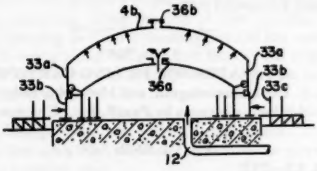
Taizo Fujiwara, Hatogaya; Kazuyoshi Sasaki, Sagamihara; Takanori Kimura, Tokyo; Shinya Nakano, Yokohama; Seiro Yamaoka, Funabashi, and Koichi Yamamoto, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 27, 1973, Ser. No. 374,262

Claims priority, application Japan, June 28, 1972, 47-64781; July 25, 1972, 47-73878; Dec. 8, 1972, 47-123109; Jan. 17, 1973, 48-7082

Int. Cl.² E04G *21/00*

U.S. Cl. 52—747 **1 Claim**



1. In an assembly of a double-shell tank, a floating tank assembling method comprising the steps of

a. forming uppermost inner and uppermost outer shell assemblies by assembling on the ground inner and outer roofs and first inner and outer side plates respectively,

b. providing air-tight sealing between said uppermost inner and outer shell assemblies,

c. introducing compressed air into the uppermost inner and outer shell assemblies so as to float the uppermost outer shell assembly to a predetermined height,

d. welding a second outer side plate to the first outer side plate of the floated uppermost outer shell assembly,

e. introducing compressed air into the uppermost inner shell assembly so as to float the last-named assembly to a predetermined height,

f. welding a second inner side plate to the first inner side plate of the floated uppermost inner shell assembly, and

g. repeating steps (c), (d), (e) and (f) until the lowermost inner and outer side plates are welded to the inner and outer shell assemblies, respectively.

3,906,701

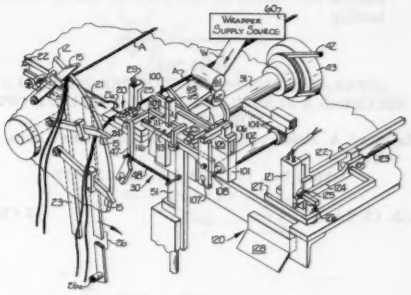
APPARATUS AND METHOD FOR PACKAGING SHOELACES

Newman McIntyre, Shelby, N.C., assignor to McIntyre Packaging Company, Shelby, N.C.

Filed May 11, 1973, Ser. No. 359,251

Int. Cl.² B65B *13/16*

U.S. Cl. 53—3 **22 Claims**



1. A method of forming a shoelace into a convolute wound package comprising the steps of:

a. feeding a shoelace to a rotatable member with at least medial length portions of the shoelace extending parallel to the rotatable member and then forming a folded portion in the shoelace substantially about the midpoint of the length thereof and connecting the folded portion of the shoelace to the rotatable member with the remaining portions of the shoelace trailing therebehind,

b. rotating the rotatable member while guiding the remaining portions of the shoelace into overlying relation with the folded portion and into side-by-side relationship in parallel planes to form on the rotatable member respective side-by-side convolute windings interconnected by the folded portion and with the respective free ends of the shoelace being beside each other,

c. removing the interconnected convolute shoelace windings from the rotatable member and thereafter flattening the same, and

d. positioning a wrapper around the flattened convolute shoelace windings to maintain the same intact and form a package.

3,906,702

METHOD OF PACKING

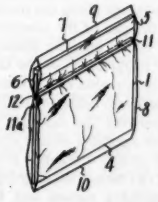
Yoshiaki Yano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 24, 1973, Ser. No. 399,965

Claims priority, application Japan, Sept. 29, 1972, 47-98465

Int. Cl. B65b *61/18*

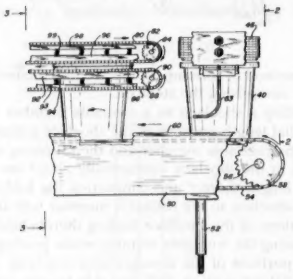
U.S. Cl. 53—14 **8 Claims**



1. The method of packing an article which includes:

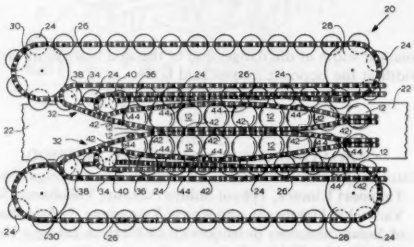
a. wrapping the article to be packed with a packing film of synthetic resin which has thermal contractability;
b. closing and sealing the wrapping in said packing film;
c. temporarily attaching a strip film to said packing film;
d. expanding the air sealed in said packing film by heating to cause said packing film to adhere to said strip film before contraction of the packing film; and
e. thereafter contracting said packing film with said strip film into close contact with said article to be packed by thermal contraction of said packing film by continued heating.

3,906,703
APPARATUS AND METHOD OF PERIPHERALLY SECURING A PLASTIC COVER TO A RIMMED OPEN TOP CONTAINER
Raymond A. Heisler, 657 Dakota Trl., Franklin Lakes, N.J. 07417
Filed Dec. 19, 1973, Ser. No. 426,337
Int. Cl.[2] B65B *7/28*
U.S. Cl. 53—42 **12 Claims**



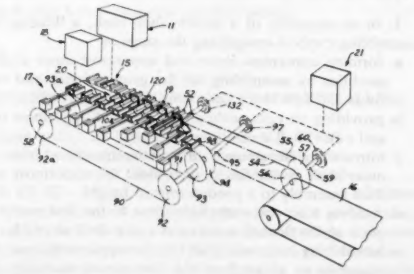
1. Automatically operated apparatus for securing a downwardly turned U-shaped outer rim portion of a cover onto the outwardly extending mating rim of an open top container so as to mount the cover on the container rim, the automatic apparatus including: (a) an advancing conveyor which receives a container and carries this container by its bottom to and through a cover discharge station; (b) means actuated by the advancing container for causing cover supply apparatus at said station to be actuated and to release and deliver one cover from a supply of covers to an initially installed position on the rim of the advancing container; (c) cover securing apparatus which includes guide means which in association with the conveyor defines a prescribed path of travel for the container; (d) a pair of like endless flexible chains running in a common plane with an extent of each of the chains disposed to lay in a parallel arrangement with the outer facing surfaces spaced from each other and maintained at this determined spacing by support means, the outer engaging surfaces of said parallel extent of each of the pair of chains traveling at like speeds and direction, the outer engaging surfaces of one chain during its passage along this parallel extent engaging the outer rim of the cover while the outer engaging surface of the other chain during its like passage along the parallel extent engaging the undersurface of the rim of the container, the engaging of the chains with the cover and the undersurface of the rim causing rotation and progression of the container; (e) a support means selectively movable to a position where it engages a local portion of the lower edge of the rim of the container so as to locally support the rim during a cover mounting sequence; (f) a pressure applying means selectively movable to a position whereat it locally engages a portion of a U-shaped outer rim of a cover; (g) means for aligning the support means and the pressure applying means and for positioning and moving the pressure applying means to establish a determined space from the support means so that the cover portion engaged thereby is locally urged into mounted condition on the cover rim, said support means and pressure means engaging the cover at a position opposite the engaging of the container and cover by the traveling chains so that the support and pressure applying means circumferentially engages the rotated container rim and cover rim to sequentially press the U-shaped rim portion of the cover into seated condition on the rim of the container, and (h) means for removing the container with its mounted cover from the apparatus.

3,906,704
APPARATUS FOR ASSEMBLING CARRIERS TO CONTAINERS
Ernest Ray Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., St. Louis, Mo.
Filed Oct. 15, 1973, Ser. No. 406,433
Int. Cl. B65b *21/02*
U.S. Cl. 53—48 **5 Claims**



1. Apparatus for assembling an interconnected series of plastic carrier devices to containers, comprising: conveyor means for moving at least one row of containers at a predetermined speed in a horizontal path, and a pair of horizontally moving carrier feeding and applying mechanisms for each row of containers, each said pair of carrier feeding and applying mechanisms being operated at a predetermined faster speed than said containers for applying said carriers to said containers in said horizontal path.

3,906,705
APPARATUS FOR FILLING CARTONS
Charles C. Beck, Bloomington, and Melford J. Bahr, Corcoran, both of Minn., assignors to Paxall, Inc., Chicago, Ill.
Filed Mar. 25, 1974, Ser. No. 454,083
Int. Cl. B65b *5/00*
U.S. Cl. 53—252 **3 Claims**



1. Apparatus for loading cartons with articles comprising first continuously driven conveyor means having means for carrying open-ended cartons, second continuously driven conveyor means, said second conveyor means moving substantially parallel and in timed relation to said first conveyor

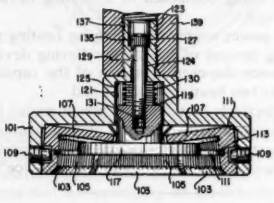
means, third continuously driven conveyor means, said third conveyor means having mounted thereon a plurality of transfer chutes, said third conveyor means being interposed between said first conveyor means and said second conveyor means, said third conveyor means moving substantially parallel and in timed relation to said first and said second conveyor means, each of said transfer chutes carrying individual upwardly extending means for camming the uppermost flap on said open-ended carton into an open position and holding such flap in said open position, an article tray mounted on said second conveyor means and pushing means for moving articles from said tray and into said carton, whereby articles are moved from said tray across said transfer chute and into an open end of a carton while the carton proceeds continuously on said first conveyor means.

3,906,706

CAP-TIGHTENER

Vincent N. Conti, West Hempstead, N.Y., assignor to Dairy Cap Corporation, Jamaica, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,631
Int. Cl.[2] B67B *3/20*; B65B *7/28*
U.S. Cl. 53—331.5 **19 Claims**



1. A cap tightener for threading a cap onto a bottleneck, comprising:

a. a housing having a top, side wall and open end;

b. a plurality of cap gripping elements positioned within said housing and facing the open end thereof, said cap gripping elements together defining a cap receiving opening, and each of said gripping elements having a first actuating portion extending along the top of said housing and a second gripping portion extending toward the open end of said housing along the side wall thereof for alignment with the side of the cap when positioned within said cap receiving opening;

c. pivot means for mounting said gripping elements in said housing for pivoting movement about a pivot axis between a first open cap receiving position and a second cap gripping position; and

d. spring means disposed below the pivot axis engaging along the gripping portions of the gripping elements and providing the sole means for normally urging them toward the side wall of the housing and into said cap receiving position, said actuating portions extending inwardly of the side wall of the housing and toward the open end thereof when the gripping portions are in said cap receiving position.

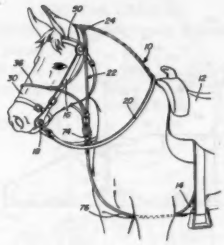
3,906,707

HORSE TIE DOWN

Veldon Morgan, Ellsworth, Nebr. 69340

Filed Mar. 4, 1974, Ser. No. 448,067
Int. Cl. B68b *1/00*
U.S. Cl. 54—35 **9 Claims**

1. A hold down harness for the head of a horse when being ridden with a conventional cinch equipped saddle and a bridle, said harness comprising first elongated flexible tension member means arranged to form a first generally upright downwardly opening inverted U-shaped loop including opposite side legs interconnected by an upper bight portion and a second upstanding rearwardly and downwardly inclined and downwardly opening inverted U-shaped loop including opposite side legs interconnected by an upper bight portion, anchor means anchoring the lower ends of corresponding legs of said loops together, the bight portion of said first loop being elevated above the bight portion of the second loop, an elongated upstanding flexible tether member, said anchor means including means anchoring the ends of the legs of said loops to the



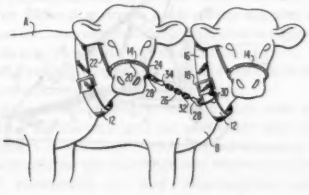
upper end of said tether member, said tether member being adapted to pass downwardly and rearwardly between the front legs of a horse and including means on its lower end adapted to anchor said tether member to the mid-portion of said cinch, and second elongated flexible tension member means arranged to form a third rearwardly and downwardly opening loop including lower opposite side portions anchored to the upper end portion of the opposite side legs of said first loop.

3,906,708

METHOD AND APPARATUS FOR BREAKING AND TRAINING ANIMALS

John Buckley Davis, Old Frankfurt Pk., Rt. No. 8, Lexington, Ky. 40504

Filed Feb. 14, 1974, Ser. No. 442,555
Int. Cl. B68b *1/00*
U.S. Cl. 54—71 **5 Claims**



1. A method of breaking two unbroken animals of generally similar genus and size, said method comprising in sequence, the steps of:

a. tethering both animals close together by means of a neck strap on one animal and a bridle on the other such that said one animal leads the other,

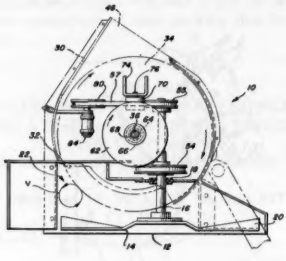
b. reversing the harness and bridle connections of said animals such that said other animal then leads said one animal, and

c. linking both animals closely together by means of bridles on both animals.

3,906,709
ROTARY MOWER

Keith H. Rhodes, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 21, 1974, Ser. No. 434,922
Int. Cl. A01d 35/26
U.S. Cl. 56—13.3 6 Claims

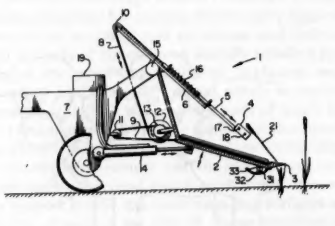


1. In a mower having a rotary blade supported on a blade shaft for rotation about a vertical axis in a blade housing which has an upwardly opening outlet port and a fan supported in a fan housing for rotation on a fan shaft about a horizontal axis perpendicular to said vertical axis, drive means for said blade shaft, an endless belt having inner and outer surfaces, a pulley on said blade shaft cooperating with said inner surface of said belt; and means on said fan shaft cooperating with said outer surface for driving said fan shaft from said belt.

3,906,710
HEIGHT-OF-CUT CONTROL FOR A CROP HARVESTING IMPLEMENT

Glen S. Pask, Saskatoon, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 25, 1974, Ser. No. 454,747
Int. Cl.[2] A01D 75/14
U.S. Cl. 56—10.2 9 Claims



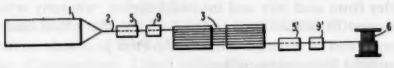
1. A height control for a crop harvesting implement having a vertically adjustable table with a cutting bar for cutting off crop material and leaving stubble, said height control comprising:

a. sensing means disposed behind the cutting bar for indicating the length of the crop material cut by the cutting bar;
b. means for sensing the position of the cutting bar to provide an indication of the height of the stubble;
c. means for determining if the indicated stubble height corresponds with a preselected relationship to the indicated length of cut crop material; and
d. means responsive to deviations from the preselected relationship for adjusting the cutting bar height to establish the preselected relationship.

3,906,711
METHOD AND APPARATUS FOR APPLYING STRESS RELIEVING TREATMENT FOR STRANDED STEEL WIRES

Kazunori Nakamura, and Hiromu Sibasaki, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed June 14, 1974, Ser. No. 479,384
Int. Cl. D07b 3/00
U.S. Cl. 57—34 R 4 Claims



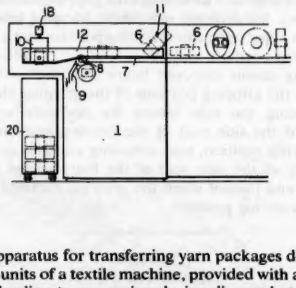
3. An apparatus for continuous stress-relieving treatment of a stranded steel wire, said apparatus comprising:

a capstan for leading stranded steel wire out of a stranding machine upstream thereof, and for winding the stranded steel wire onto a drum downstream thereof,
stress-relieving devices disposed respectively immediately upstream and downstream of the capstan at operative positions with respect to the steel wire, each stress-relieving device being composed of a heating device and a cooling device,
an electrical power source for supplying heating power to the heating devices of the stress-relieving devices, said heating device disposed upstream of the capstan being divided into two heating sections, and
means for selectively switching the power source from one of said divided heating sections of said heating device disposed upstream of said capstan to said heating device disposed downstream of said capstan, and vice versa.

3,906,712
METHOD AND APPARATUS FOR TRANSFERRING YARN PACKAGES FROM A TEXTILE MACHINE TO A CARRYING DEVICE

Tsutomu Miyazaki; Takashi Kato, both of Kariya; Yoshihisa Suzuki, Nagoya; Toshio Yoshizawa, Chiryu, and Shozo Ueda, Kariya, all of Japan, assignors to Daiwa Boseki Kabushiki Kaisha and Kabushiki Kaisha Toyodo Jidoshokki Siesakusho, Osaka, both of, Japan

Filed June 18, 1974, Ser. No. 480,392
Claims priority, application Japan, June 22, 1973, 48-71043
Int. Cl. D01h 9/10, 1/12; B65h 54/02
U.S. Cl. 57—53 11 Claims



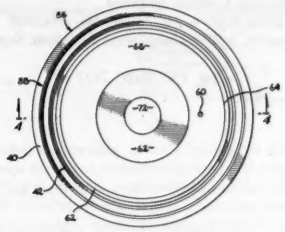
3. An apparatus for transferring yarn packages doffed from operation-units of a textile machine, provided with a discharge conveyer leading to a carrying device disposed at a position below a position close to the outside of a carrying terminal of said discharge conveyer, comprising means for correcting the carrying position of yarn packages on said conveyer, means for temporarily positioning said correctly positioned yarn packages received from said conveyer at a position close to the outside of a terminal of said conveyer, means for detecting the existence of a yarn package on said positioning means, said positioning means provided with means for supporting and discharging said yarn package, and an actuation means for

operating said supporting and dischaging means, said actuation means being actuatable by a control signal issued from said detecting means.

3,906,713
ELECTRONIC ALARM WRISTWATCH

Haruo Suda, Tokorozawa, and Fujio Ishida, Kokubunji, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1974, Ser. No. 500,891
Claims priority, application Japan, Aug. 29, 1973, 48-96881; Sept. 10, 1973, 48-101860
Int. Cl.² G04C *21/00*; G04B *23/12*
U.S. Cl. 58—38 **11 Claims**

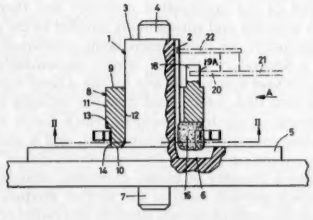


1. An electronic alarm wristwatch comprising a time display means, an alarm presetting device, an alarm circuit means for operating upon the coincidence of the time preset by said alarm presetting device and that designated by said time display means and for providing an electrically varying signal upon said coincidence, an electro-means for vibrating when energized by said alarm circuit with said varying signal, a membrane on which said electro-means is fixed to be thereby vibrated, a back cover having apertures to release sound waves emanating from the membrane out of the watch case, and a case band holding said back cover, wherein said membrane is dish shaped with a plurality of concentric wrinkles, the central portion and rim thereof are flat, said electro-means is fixed on said central portion, and said rim is placed between said back cover and case band.

3,906,714
WATCH ESCAPEMENT

Jean-Claude Schneider, La Chaux-de-Fonds, Switzerland, assignor to Fabrique d'Horlogerie Chs. Tissot et Fils S.A., Neuchatel, Switzerland

Filed June 10, 1974, Ser. No. 477,911
Claims priority, application Switzerland, June 20, 1973, 8986/73
Int. Cl.² G04B *15/00*; G04C *3/04*
U.S. Cl. 58—115 **9 Claims**

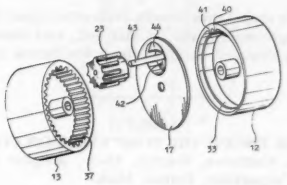


1. In a watch escapement:
a hairspring,
a balance,
a staff integral with said balance, and
a metal ring engaging said staff on one side of said balance, said metal ring having two end faces, one of said end faces having a projection projecting therefrom parallel to the axis of the staff and acting as a roller-pin, the other one of said end faces having means for fastening the inner end of the hairspring thereon.

3,906,715
DIGITAL CLOCK

Kenjiro Goto, Tokyo, Japan, assignor to Kansei Kogyo Kabushiki Kaisha, Japan

Filed Oct. 25, 1973, Ser. No. 409,469
Claims priority, application Japan, Nov. 9, 1972, 47-129308
Int. Cl.² G04B *19/02*
U.S. Cl. 58—125 C **12 Claims**



1. A digital clock comprising:
a frame means;
a main shaft supported on said frame means;
a driving source;
A plurality of time indicating drums rotatably mounted on said main shaft each time indicating drum including inner teeth on one side and driving teeth on the other side of the inner periphery thereof;
coupling means for coupling said driving source to the lowest order time indicating drum and for transmitting a driving force from said driving source to the lowest order time indicating drum;
a plurality of intermediate pinions respectively arranged inside each of said time indicating drums and adapted to engage said inner teeth on one side and said driving teeth on the other side thereof so as to transmit the driving force from said lowest order time indicating drum to the upper order time indicating drums;
a plurality of pinion support plates positioned between each of said time indicating drums each pinion support plate having a cut out, a cover, parallel to said pinion supported plate which covers one part of said cut out;
a pinion shaft fixedly arranged through said cut out to rotatably support each said pinion thereon; and
a pinion locking means arranged on said other side of the inner locking means arranged on said other side of the inner periphery of said drums and adapted to engage said intermediate pinions on said other side thereof to prevent rotational movement of said intermediate pinions whereby the driving force exerted on said lowest order time indicating drum from said driving source is transmitted intermittently to each of said upper order time indicating drums.

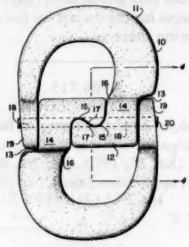
3,906,716
CONNECTOR LINK

Mortimer Russell Dock, P.O. Box 231, Blackstone, Va. 23824

Filed Aug. 30, 1974, Ser. No. 502,024
Int. Cl.² F16G *15/04*
U.S. Cl. 59—85 **7 Claims**

1. In a connector link bearing the configuration of a common link of chain and comprising two identical end members, each having a major leg and a minor leg and being retained in

secure engagement by a transverse member inserted therethrough, the improvement of centrally disposed abutting plane faces of the said major legs of said two end members, the pressure of said plane faces against each other being increased



to move the major ends toward each other upon the imposition of longitudinal stress on said link; said abutting plane faces being disposed obliquely from the lateral axis of said link.

3,906,717

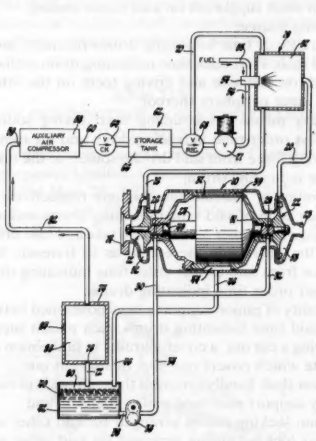
TURBINE ENGINE OIL SUMP EMISSION CONTROL

Charles C. Matthews, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1974, Ser. No. 453,288

Int. Cl.[2] F02C 7/06; F01M 9/10

U.S. Cl. 60—39.08 **2 Claims**



1. In a gas turbine engine having a compressor, burner, turbine and power shaft coupling said compressor and turbine and wherein an oil distribution system supplies lubricant to bearing means in communication with a lubricant gallery and a return path back to a lubricant sump of the engine and seal means are disposed between high pressure cavities in the turbine engine and the lubricant gallery, the improvement comprising: a vent conduit from the lubricant sump of the turbine engine, a burner nozzle having a primary air inlet and a fuel inlet, an auxiliary air compressor for supplying primary air to said air inlet, said auxiliary air compressor having an inlet and an outlet, a canister having a bottom inlet therein in communication with said vent conduit of the sump and having an outlet therefrom connected to said auxiliary air compressor inlet, an atmospheric bleed in said canister to provide make-up flow of air from atmosphere along with the withdrawal of vapors through said vent pipe to prevent evacuation of said sump during turbine engine operation, control means communicating the outlet of the auxiliary air compressor with said air inlet fitting on said burner nozzle operative to allow air flow from the auxiliary air compressor to the burner only when the engine is running, said auxiliary air compressor being operative to draw hydrocarbon vapors from the sump for discharge through the burner nozzle on said burner to cause hydrocarbon vapors within said sump to be consumed within the burner during normal turbine engine combustion operation.

3,906,718

COMBUSTION APPARATUS FOR GAS TURBINE ENGINES

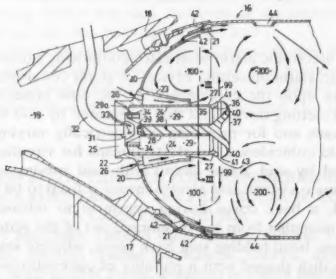
Robert David Wood, Derby, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Sept. 4, 1973, Ser. No. 394,395

Claims priority, application United Kingdom, Sept. 7, 1972, 41504/72

Int. Cl.[2] F02C 7/22

U.S. Cl. 60—39.65 **2 Claims**



1. Combustion apparatus comprising:

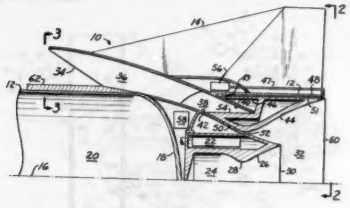
a combustion chamber having an upstream end wall and a downstream wall, openings in said chamber walls defining first and second air inlet means for delivering air into said chamber, a member extending axially downstream of said upstream end wall defining at least in part a passage which is in communication with said first air inlet means, means for supplying fuel to the passage, a deflecting member disposed for deflecting the air/fuel mixture at the downstream end of the passage in a direction substantially radially of said passage whereby to promote a substantially toroidal vortex circulating first radially outward from said passage, then upstream toward the upstream end wall of the combustion chamber and then downstream adjacent and substantially parallel to the passage, said secondary air inlet means being positioned to promote a secondary toroidal vortex immediately downstream of said first vortex and having a hand opposite to that of said first vortex, said member defining said passage being a cylindrical member which forms with said deflecting member an annular outlet, and a plurality of axially extending straight dividers which divide the passage into a plurality of axially extending straight sectors and which prevent swirl in the air/fuel mixture passing through the passage sectors wherein said outlet converges radially around its circumference and terminates in an annular discharge opening through which the air/fuel mixture is discharged into the combustion chamber.

3,906,719

ROCKET HAVING MOVABLE SECONDARY NOZZLE

Clair M. Beighley, El Dorado County; Orin J. Demuth, and Richard W. Froelich, both of Sacramento County, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Sept. 19, 1968, Ser. No. 764,369
Int. Cl. F02k 9/06
U.S. Cl. 60—225 9 Claims



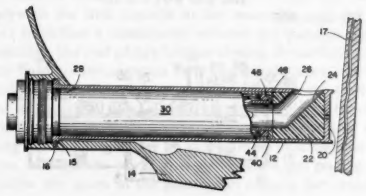
1. A rocket comprising: a body having an axis; a primary rocket motor mounted to said body for producing thrust, said motor having a primary combustion chamber and a primary nozzle with an exhaust opening; a secondary chamber in said body, said secondary chamber being in fluid communication with said primary nozzle; air inlet means to said secondary chamber; and secondary nozzle means in said secondary chamber, said secondary nozzle means having a throat therein and being movable along said axis between a first position wherein said secondary nozzle closes said air inlet means with said throat being upstream of said primary nozzle exhaust opening and a second position wherein said secondary nozzle is downstream from said primary nozzle.

3,906,720

IGNITER ASSEMBLY FOR ROCKET MOTORS

William M. Boydston, Newport Beach, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Jan. 7, 1965, Ser. No. 424,141
Int. Cl. F02k 9/04
U.S. Cl. 60—256 5 Claims



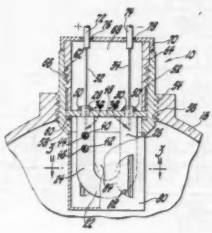
1. In a rocket motor having a combustion chamber, a receptacle in said combustion chamber, an igniter assembly received by said receptacle, said igniter assembly including at least two spaced containing means one interior of the other, the interior one of said containing means being perforate and the exterior one thereof being imperforate, igniter charge means disposed between said spaced containing means, means dividing the interior one of said containing means into an inner end and an outer end, said inner end communicating with said combustion chamber, booster charge means received in said outer end, adaptor means enclosing said igniter assembly in said receptacle, said adaptor means including initiator charge means communicating with said booster charge means, and a squib for igniting said initiator charge means so that upon ignition said squib will, in order, cause initiation of said initiator charge means, said booster charge means, and said igniter charge means causing a detonation wave to pass through said inner end into said combustion chamber.

3,906,721

THERMOELECTRIC EXHAUST GAS SENSOR

Adolph L. Micheli, Mt. Clemens, and Glenn E. Sutherland, Fraser, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 22, 1974, Ser. No. 499,466
Int. Cl.[2] F01N 3/00; G01N 31/00
U.S. Cl. 60—276 3 Claims



1. In an exhaust system including an exhaust pipe for directing the flow of exhaust gases from an internal combustion engine, an extremely durable and easily attachable thermoelectric exhaust gas sensor for detecting the quantitative content of residual combustibles in the exhaust gas that provides an accurate and high output with a minimum of undesirable thermal gradient effects, said sensor comprising:

a U-shaped ceramic body serving as a common thermoelectric element for each of two thermocouple junctions, said U-shaped ceramic body being of titanium dioxide doped with a pentavalent ion from Group V of the Periodic Table of the Elements and having two leg portions with ends thereon;

two chromel wires;

one end of one of said chromel wires embedded in the end of one of said leg portions, one end of the other chromel wire embedded in the end of the other leg portion, said wires forming a metal-ceramic thermocouple junction in each of said leg portions and said leg portions providing corrosion and abrasion protection for said embedded wire ends;

one of said leg portions having at least one opening therethrough closely adjacent one of said wires forming one of said thermocouple junctions;

a porous filling of catalytic ceramic particles in said opening providing a high surface area situs for reaction of residual combustibles in the exhaust gas;

means attached to the ends of said leg portions for mounting said body in the exhaust pipe with said leg portions transverse to the flow of exhaust gases, wherein both thermocouple junctions are spaced about the same distance downstream from said internal combustion engine to minimize undesirable thermal gradient effects between said thermocouple junctions; and

means for isolating unembedded portions of said wires from the exhaust gas while uniformly exposing leg portions containing said thermocouple junctions to the exhaust gases, whereby residual combustibles in the exhaust gases can react in said leg opening to produce a temperature differential between said thermocouple junctions and provide high electrical output therebetween accurately proportional to the quantitative content of said residual combustibles in the exhaust gas without deleterious effects on said wires forming said junctions.

3,906,722
EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINES

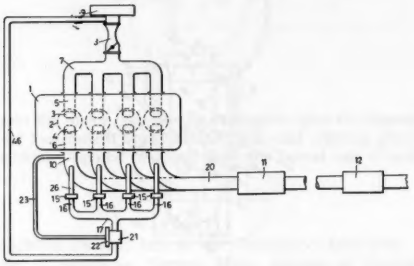
Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 421,643, Dec. 4, 1973, abandoned, which is a continuation of Ser. No. 182,654, Sept. 22, 1971, abandoned. This application Feb. 5, 1974, Ser. No. 439,943

Claims priority, application Italy, Sept. 22, 1970, 30057/70

Int. Cl.[2] F01N 3/10

U.S. Cl. 60—289 5 Claims



1. A discharge system for the exhaust gases of an internal combustion engine for a motor vehicle in which the engine is provided with a cylinder head, cylinders in the head, on intake manifold communicating with the cylinders and an exhaust line, an exhaust duct for each cylinder, and having an optimized length, each exhaust duct communicating with the exhaust line, an air feeding duct opening into each exhaust duct, each air feeding duct having an automatic control valve and conduit means connecting said air feeding ducts upstream of said automatic control valve with the intake manifold whereby during engine operation said automatic control valves are cyclically opened and closed, with the opening taking place due to the negative pressures cyclically occurring in the individual exhaust ducts, with the opening allowing the intake of atmospherical air into the individual exhaust ducts downstream of said valves thereby obtaining a post combustion of the admixture of air with the unburned gases, said discharge system further comprising a throttling device for the control of the air fed by the said automatic valves, said device being mounted upstream of the automatic valves, and actuating means for said device comprising a sensing member responsive to average pressure of the exhaust gases in the said exhaust ducts, said device and said sensing member being connected so that the lower is the pressure in the exhaust ducts the lower is the passage section for the air in the throttling device and vice versa.

3,906,723
EXHAUST GAS PURIFYING SYSTEM

Noboru Matumoto; Takao Nonoyama, both of Toyota; Tutomu Tomita, Okazaki, and Yukio Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 23, 1974, Ser. No. 499,841

Claims priority, application Japan, Mar. 8, 1974, 49-26154; Mar. 8, 1974, 49-26155

Int. Cl.[2] F02B 75/10; F01N 3/14

U.S. Cl. 60—290 10 Claims

1. In an exhaust gas purifying system for use in an internal combustion engine, wherein there are provided an air cleaner, a suction pipe, a throttle valve provided in said suction pipe, a throttle positioner for controlling said throttle valve, an exhaust manifold and a catalyst convertor, the improvements comprising:

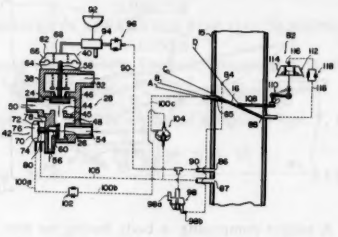
an air switching device provided with a first and second valves;

an air supply pipe for connecting said air switching device to said air cleaner;

a first pipe for feeding air from said air cleaner to said exhaust manifold through said first and second valves;

a second pipe for feeding air from said air cleaner through said first and second valves to said catalyst convertor;

means for actuating said first valve due to a negative pressure which has been introduced therein through a port



provided in said suction pipe but in a position in the vicinity of the attaching position of said throttle valve within said suction pipe; and

means for actuating said second valve which normally closes said second pipe due to the difference between the negative pressure which has been introduced through a port positioned between the throttle opening position of said throttle valve and the idling position, and the negative pressure on the downstream side of the throttle valve within said suction pipe.

3,906,724
AIR CLEANER ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE HAVING AN EXHAUST GAS PURIFICATION SYSTEM

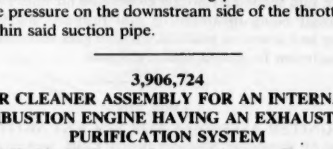
Masaaki Yoshizaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed July 11, 1974, Ser. No. 487,735

Claims priority, application Japan, Dec. 3, 1973, 48-137821[U]

Int. Cl.[2] F01N 3/10

U.S. Cl. 60—305 7 Claims



1. An air cleaner assembly for providing filtered air to both a carburetor and an exhaust gas purification system of an internal combustion engine, said assembly comprising a casing, means defining an air inlet to said casing, filter means located within said casing, seal means including said filter means separating the interior of said casing into an atmospheric air section communicating with said air inlet means and a clean air section, said atmospheric air section being sealed from said clean air section to direct all air entering said atmospheric air section through said filter means into said clean air section, partition means dividing said clean air section into a first compartment and a second compartment in an arrangement wherein said first and second compartments are sealed and separated from each other and from said atmospheric air section by said filter means, said partition means and said seal means, first duct means communicating said first compartment with said carburetor, and second duct means

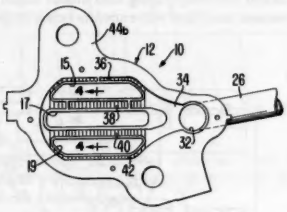
communicating said second compartment with said exhaust gas purification system.

3,906,725

EXHAUST EMISSIONS CONTROL DEVICE

John F. Addoms, Rocklin; David L. Kors, El Dorado Hills, and Billy R. Lawver, Rancho Cordova, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed July 2, 1973, Ser. No. 375,975
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—307 9 Claims



1. An exhaust emissions control device comprising: a platelet assembly including a multiplicity of stacked, interconnected plates, the plates having first aligned cutouts defining an elongated exhaust passage extending perpendicularly to said plates through said assembly, and aligned second cutouts spaced from the first cutouts and defining an elongate airflow duct extending generally perpendicularly to said plates through said assembly, a plate member connected to one end of said stacked plates, the plate member defining another first cutout aligned with the first cutout in said stacked plates and a multiplicity of spaced-apart outlet ports distributed along a peripheral margin of the first cutout in the plate member, the outlet ports being further positioned and dimensioned to overlie the second cutout defined by the plate in contact with the plate member to thereby place the airflow duct in fluid communication with the exhaust passage through the assembly, each port having a linear extent along the peripheral margin of the first cutout substantially less than the total length of the peripheral margin, a pair of end plates placed against and connected to the plate member and to another end of the stacked plates, the end plates including first cutouts aligned with the first cutouts in the assembly and the plate member to define a continuous exhaust gas passage through the assembly, the end plates further closing the airflow duct to prevent fluid communication between the duct and the exterior and to direct fluid flow in the duct through the ports and into the exhaust gas passage, and means defining a fluid flow conduit for connecting the airflow duct with a source of an oxidizing fluid, whereby the oxidizing fluid entering the duct will pass through the ports into the exhaust gas passage and will oxidize the gases in the passage to reduce the pollutants therein.

3,906,726

POSITIONER METHODS AND APPARATUS

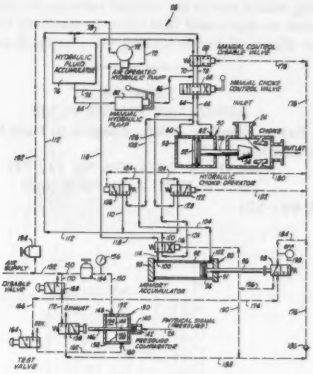
Douglas L. Jameson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 20, 1974, Ser. No. 534,848
Int. Cl.[2] F15B 1/02, 15/18
U.S. Cl. 60—327 11 Claims

9. A method of automatically changing the position of a device operated by manually controllable hydraulic cylinder means which includes a movable piston connected to said device in response to a physical signal, and then repositioning said device to its original setting upon the withdrawal of said physical signal comprising the steps of:

a. generating a control signal in response to said physical signal;

b. utilizing said control signal to operate the movable piston of said hydraulic cylinder means whereby pressurized hydraulic fluid is introduced into said hydraulic cylinder means on a selected side of said movable piston therein to move said piston in a desired direction and to displace hydraulic fluid from the other side of said piston;



c. storing the hydraulic fluid displaced from said hydraulic cylinder means throughout the duration of said physical signal; and

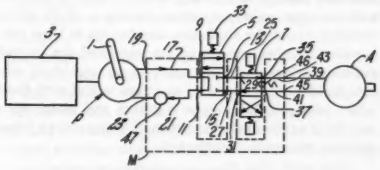
d. then reintroducing said stored hydraulic fluid into said hydraulic cylinder means on the side of said piston from which it was displaced thereby restoring said piston to the position it occupied prior to the receipt of said physical signal.

3,906,727

HYDROSTATIC DRIVE WITH DIRECTION MEMORY

James S. Hull, Waterford, Mich., assignor to Melvin Corporation, Bay City, Mich.

Filed Sept. 26, 1973, Ser. No. 400,985
Int. Cl. F15b 15/18
U.S. Cl. 60—403 4 Claims



1. A manifold and integral valve assembly for a hydrostatic drive system that includes a pump and an actuator, said assembly including a manifold having first and second valve assemblies attached thereto. the first of the valve assemblies comprising a first two position four-way valve and the second of the valve assemblies comprising a second two position four-way valve, a first pair of passages in the manifold operatively connecting a set of pump ports in the manifold with a first pair of ports opening to the first valve assembly, a second pair of passages in the manifold connecting a second pair of ports opening to the second valve assembly, a third pair of passages in the manifold operatively connecting a second pair of ports opening to the second valve assembly with a pair of actuator ports, said first four-way valve having a first position wherein its first pair of ports are interconnected and a second position wherein its first pair of ports are connected to its second pair, the second four-way valve having a first position wherein its

first and second pair of ports are connected in one way to direct oil to and from an actuator to drive it in one direction and a second position wherein the first and second pairs of ports are connected in a second way to direct oil to and from an actuator in an opposite direction, operating means to move said second valve to one or the other of its positions, means to hold said second valve in either of its positions until said operating means moves the second valve to its other position, and means to move said first valve between its two positions to either direct oil to the second valve or back to the pump.

3,906,728

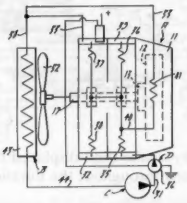
AUXILIARY WATER PUMP

Don B. Kantz, Ferndale, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 4, 1974, Ser. No. 512,741

Int. Cl.[2] F02G *1/04;* **F01K** *9/00*

U.S. Cl. 60—524 **12 Claims**



1. In an external continuous combustion engine, a cooling system for said engine, comprising:

a. circuit means for positively conveying a cooling fluid between a heat absorbing zone and a heat extraction zone, said circuit means having a fluid passage,

b. primary pumping means driven by said engine for moving said fluid through said fluid passage during normal operation of said engine, said primary means permitting fluid flow therethrough when deactivated, and

c. auxiliary means for moving said cooling fluid along said passage when said primary means is deactivated, said auxiliary means having a projection normally extending into said passageway during all conditions of flow through said passage, said projection having a shaft driven for rotation about the shaft axis and having at least one fluid moving member supported on said shaft for limited free rotation about an axis transverse to said shaft whereby said fluid moving member may free wheel with fluid flow when said primary means is active and positively move said fluid in response to said shaft being driven when said primary means is deactivated.

3,906,729

MULTIPLE TURBOCHARGER SYSTEM

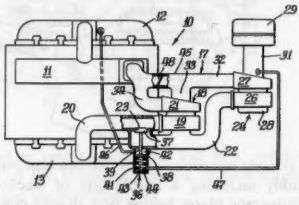
Donald H. Connor, Chillicothe, and John C. McCornack, Peoria, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Mar. 25, 1974, Ser. No. 454,094

Int. Cl.[2] F02D *23/00*

U.S. Cl. 60—600 **7 Claims**

1. A multiple turbocharging system for an engine having an intake manifold and an exhaust manifold, said system comprising; first turbocharger means for compressing engine intake air, fluid communication means communicating said first turbocharger means with said exhaust manifold and with said intake manifold, second turbocharger means for compressing engine intake air, said fluid communication means further communicating said second turbocharger means with said intake manifold and said exhaust manifold, first by-pass means in said fluid communication means for selectively permitting the diversion of exhaust gases from said exhaust manifold around said seond turbocharger means to said first turbocharger means, said first turbocharger means including a first air compressor having first inlet and outlet means, said first inlet means for receiving ambient air and said first outlet means for passing compressed air from said first air compressor, said first by-pass means including normally closed first valve means in said fluid communication means between said exhaust manifold and said second turbocharger means for permitting said diversion of exhaust gases when in open condition and for preventing said diversion when closed, said first valve means includng chamber means, a first conduit communicating said first inlet means with said chamber means, a second conduit communicating said intake manifold with said chamber means, said first valve means being responsive to the



pressure extant in said chamber means for opening and closing said first valve means to permit and prevent respectively said diversion of exhaust gases around said second turbocharger means, said first turbocharger means further including a first turbine for driving said first compressor, said first turbine having first turbine inlet and outlet means, said second turbocharger means including a second air compressor having second inlet and outlet means and further including a second turbine for driving said second air compressor, said second turbine having second turbine inlet and outlet means, second by-pass means for selectively permitting the diversion of engine exhaust gases from said exhaust manifold around said first turbine from said first turbine inlet means to said first turbine outlet means without operative passage through said first turbine.

3,906,730

LABYRINTH SEAL WITH BLOCKING MEDIUM

Hans Bellati, and Helmut Muhlhauser, both of Wettingen, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 5, 1973, Ser. No. 403,884

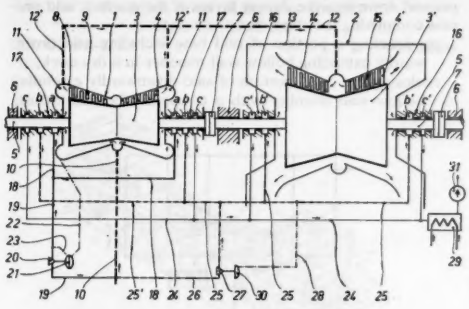
Claims priority, application Switzerland, Oct. 11, 1972, 14790/72

Int. Cl. F01d *21/06;* **F01k** *19/00*

U.S. Cl. 60—657 **6 Claims**

1. In a steam turbine plant comprising a steam turbine of the multi-stage type and which includes a housing containing multi-stage guide blading and a bladed rotor the shaft of which extends through a labyrinth seal structure provided at the exhaust end of the housing for preventing the steam from leaking outwardly from the end of the housing along the shaft, the improvement wherein said labyrinth shaft seal structure includes at least two chambers spaced axially along the shaft and labyrinth seal elements along the shaft and interposed between said chambers, means for supplying live and substantially dry steam to the axially innermost chamber of said labyrinth shaft seal structure at a pressure slightly higher than the steam pressure existing within the exhaust end of said turbine housing whereby the live and substantially dry steam flows along the shaft and labyrinth seal elements from said axially innermost chamber in an axially inward direction into the exhaust end of said turbine housing and in an axially outward direction to said axially outermost chamber, and a line extend-

ing from the axially outermost chamber of said labyrinth shaft seal structure to a vacuum pump for drawing off leakage air



entering said axially outermost chamber from the ambient atmosphere as well as steam leaking thereinto from said axially innermost chamber.

3,906,731

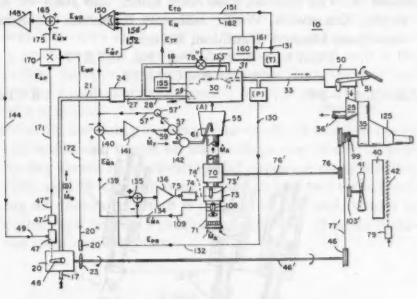
CONTROL SYSTEM FOR VAPOR ENGINES

Randolph S. Carlson, Reno, Nev., assignor to Lear Motors Corporation, Reno, Nev.

Continuation of Ser. No. 326,434, Jan. 24, 1973, abandoned. This application July 19, 1974, Ser. No. 490,185

Int. Cl.[2] F01K *13/02*

U.S. Cl. 60—665 **8 Claims**



5. A control system for a vapor powered vehicle having a power expander coupled to its transmission drive, said vehicle being operated at variable speed and power output demands through corresponding vapor that is generated and applied to said expander by a vapor generator having a combustor and a boiler that is fired thereby to provide superheated vapor substantially at a constant rated temperature and pressure, said control system comprising:

means for measuring a departure from rated pressure of the vapor being supplied to said expander;

means for measuring air mass flow into said combustor;

means for measuring fuel flow into said combustor;

means for generating an air mass flow control signal in response to the difference between the signals from said pressure measuring means and said air mass flow measuring means; and

means for generating a fuel flow control signal in response to the difference between the signals from said air mass flow measuring means and said fuel flow measuring means.

3,906,732

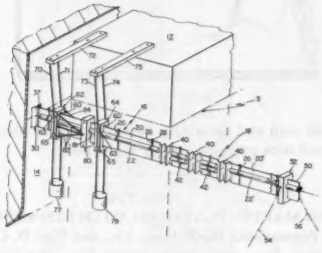
SHIPSIDE OIL BARRIER SEAL

Edward T. Tedeschi, Jr., Cohasset, Mass., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 10, 1975, Ser. No. 540,008

Int. Cl.[2] E02B *15/04*

U.S. Cl. 61—1 F **14 Claims**



1. A pier mounted shipside oil barrier seal structure floating on the water surface for use with a ship having a side surface, the water level moving vertically with respect to said ship and said pier and said ship moving horizontally with respect to said pier

said structure comprising

a floating shipside oil seal member vertically extended above and below the water level and having at its free end adjacent the ship side surface at least one flexible elastic rubber-like vertically extended sealing element for contacting the ship side surface and

pier mounting means mounting said oil seal on said pier for vertical and horizontal movement relatively thereto

said mounting means including

a pair of transversely spaced support means slideably supporting said oil seal member at spaced positions therealong for transverse movement relatively to said ship side surface

said support means being mounted for vertical movement on said pier for free vertical movement of said floating oil seal member with the water level as it changes with respect to said pier and

oil seal operating spring means connected between said oil seal member and said support means for urging said oil seal element into contact with said ships side.

3,906,733

DEVICE FOR SHIELDING GROUND WORKINGS WITH MEANS FOR CONTROLLING THE DUST

Manfred Koppers, Duisburg, Germany, assignor to Rheinstahl AG, Germany

Filed Oct. 24, 1974, Ser. No. 517,592

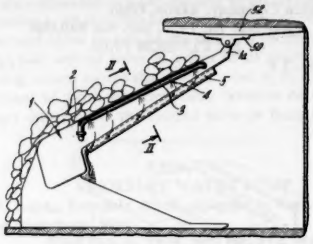
Claims priority, application Germany, Nov. 17, 1973, 2357533

Int. Cl.[2] E21D *11/00*

U.S. Cl. 61—45 D **8 Claims**

1. A device for reducing dust in workings such as underground coal mines wherein the walls are supported by shields, comprising a shield having a top and a side wall on at least one side, a liquid conduit carried by said shield adjacent the top of its side wall and connected to a liquid supply and having a plurality of openings for the liquid along its length oriented to

discharge liquid downwardly adjacent said side wall, and an elastic seal member extending outwardly from the bottom of



said side wall and defining a runoff gutter for the liquid and entrained dust extending along said wall.

3,906,734

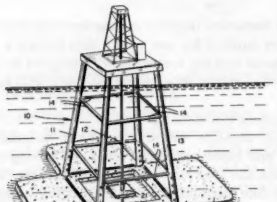
FIXED MARINE PLATFORM WITH DISPERSED BASE

Ivo C. Pogonowski, Blacksburg, Va., and Paul D. Carmichael, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,805

Int. Cl.[2] E02D *3/12, 27/02*

U.S. Cl. 61—46 **6 Claims**



1. A marine structure having substantially vertical rigid support leg means, the lower ends of the latter being adapted for embedment into the floor of a body of water to anchor the structure in said body of water,

an apron disposed adjacent to and surrounding said support leg means when the latter is embedded, being firmly connected to said vertical support leg means to form a unitary part of said platform, said apron extending outwardly from the leg means and resting on the floor of said body of water,

said apron being formed of a hardenable, fluidized material which has hardened to provide a rigid surface thereon after being deposited in fluid condition onto said floor about said support leg means.

3,906,735

FOUNDATION METHOD FOR CAISSONS

Olav Mo, Groensundveien 94, 1370-Asker, Norway

Division of Ser. No. 352,679, April 19, 1973, abandoned. This application Feb. 27, 1974, Ser. No. 446,335

Claims priority, application Norway, May 2, 1972, 1541/72

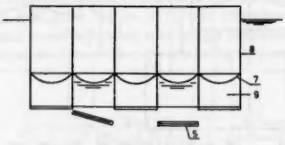
Int. Cl.[2] E02D *5/00;* **B63C** *1/06;* **B63B** *35/44*

U.S. Cl. 61—46.5 **4 Claims**

1. A method for the production of a support structure for supporting a platform above the surface of the sea, said support structure comprising a base which rests on the sea bed and which comprises at least one downwardly extending hollow wall member which is open at the bottom so as to define a downwardly opening compartment and which can be pressed down into the deeper layers of the sea bed, said process comprising the steps of:

constructing a portion of said base including said downwardly extending hollow wall member in a dry dock;

enclosing the open bottom of said downwardly extending hollow wall member with a temporary bottom closure



member so as to close off the compartment defined by the downwardly extending wall member and thereby provide a buoyancy chamber;

floating the partially constructed base portion in deep water; and

completing construction of the support structure in deep water, said temporary bottom closure member being removed after the support structure has sufficient self-floating capability.

3,906,736

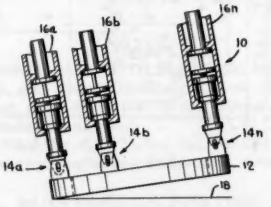
SHOCK ABSORBER APPARATUS FOR SUBSEA WELLHEAD HANDLING SYSTEM AND METHOD FOR USING SAME

Roland W. Van Houten, Palo Alto, Calif., and John W. Engstrom, Kennewick, Wash., assignors to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed May 8, 1974, Ser. No. 467,877

Int. Cl.[2] B63C *11/34*

U.S. Cl. 61—69 **6 Claims**



1. Apparatus for absorbing the shock encountered during the landing of a handling tool on a subsea wellhead, said apparatus comprising:

a. landing ring means operative for supporting said handling tool and operable to be lowered onto the upper surface of the wellhead;

b. a plurality of support means each having two ends and each having one end connected to said handling tool and operative for supporting said handling tool on the wellhead;

c. a plurality of shock absorber means each connected to the other end of said support means and operative for absorbing a suddenly applied force; and

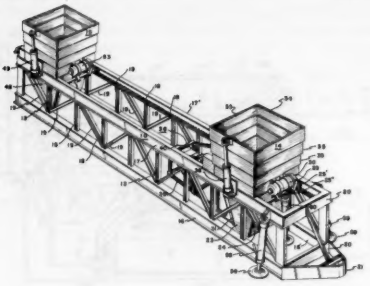
d. a plurality of coupling means for coupling each of said shock absorber means to said landing ring means and operative to permit each of said shock absorber means to rotate.

3,906,737

SEWER LAYING SYSTEM

William R. Brown, P. O. Box 54, Kingston, Idaho 83839

Filed Oct. 9, 1973, Ser. No. 404,847
Int. Cl.[2] E02F 5/10
U.S. Cl. 61—72.5 18 Claims



1. A tile setting apparatus, comprising:

a chassis trestle including a pair of parallelly disposed base rails, a pair of top rails disposed on pillars parallelly above and in substantial alignment with said base rails, and transverse beams connecting respective terminal ends of said base and top rails;

a tile-bed laying car mounted between said top rails of said trestle on trolleys, one of said trolleys being provided with means for motivating said car along said top rail, said car having side walls and end walls forming an enclosure which is open at the top and bottom to collect and pass a predetermined layer of aggregate material and a tile setting bumper projecting rearwardly from said car and having a push ring having means for engaging a bell flange of a tile; and

a cover fill car being mounted rearwardly of said bed laying car within said trestle on said trolleys, one of said trolleys having means for motivating said cover car along said top rails, said cover car having side walls and end walls forming an enclosure which is open at its top and bottom to collect and release a predetermined layer of cover material over installed tiles.

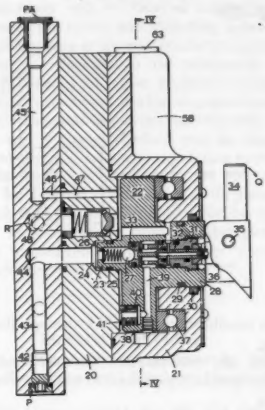
3,906,738

CONTROL SYSTEMS FOR USE WITH MINERAL MINING APPARATUS

Walter Weirich, Dortmund, and Karl Heinz Rosenhovel, Dorfeiche, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfhalia, Germany

Filed Mar. 14, 1973, Ser. No. 341,012
Claims priority, application Germany, Mar. 16, 1972, 2212686
Int. Cl. E21d 15/44
U.S. Cl. 61—45 D 13 Claims

1. In a hydraulically operable mine roof support arrangement, which comprises a group of roof support units and an automatic shifting means for controlling the advance of the units in an ordered sequence from one or other end of the group, depending upon which of two input lines to the shifting means is pressurized, the improvement comprising a control system for initiating the operation of the shifting means, said control system comprising two devices each of which is adapted to supply pressure fluid to a respective one of the two input lines to the shifting means, each device being adapted to be placed in a condition in which pressure fluid may be supplied through the device to the input line and interlock means operable upon one of said devices being placed in the condition aforesaid to prevent the other device being placed in said condition or to reset the said other device in a neutral condition.

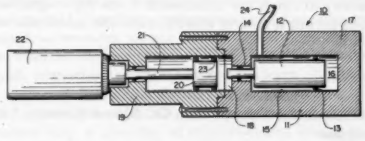


3,906,739

VARIABLE PNEUMATIC VOLUME FOR CRYOGENIC COOLERS

Peter K. Raimondi, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,837
Int. Cl.[2] F25B 9/00
U.S. Cl. 62—6 5 Claims

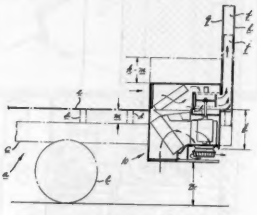


1. A free displacer cryogenic cooler including a displacer housing having a cold head end for contacting an object to be cooled and in which a free displacer is positioned to reciprocate in response to pressure pulses provided by a remote compressor connected by conduit means to a region of said displacer housing sealed from said cold head end by sealing means and from the end of said displacer opposite the end proximate said cold head end by further sealing means, and further housing means joined in a sealed manner to said displacer housing forming a pneumatic volume proximate the opposite end of said displacer, wherein the improvement comprises: means associated with said pneumatic volume for variably adjusting and maintaining the size of said pneumatic volume so that as the free displacer is reciprocated by said pressure pulses, the cooling at the cold head end of the cooler can be maximized by simultaneously adjusting the pneumatic volume.

3,906,740
AIR CONDITIONER ADAPTED FOR THROUGH-FLOOR INSTALLATION

DeWayne James Thomas, Belleville, Ill., assignor to Intertherm, Inc., St. Louis, Mo.

Filed May 31, 1974, Ser. No. 475,100
Int. Cl. B60h 3/04
U.S. Cl. 62—239 7 Claims



1. An air conditioner adapted for through-floor installation, comprising

a cabinet and conventional air-conditioner components therein operatively connected to each other, the cabinet having

and upper evaporator compartment including an air inlet and a cooling air outlet, whereby to provide a path for air to be cooled and housing along said path the evaporator coil and refrigerated air blower of said components,

partition means to provide a bottom of said evaporator compartment and of said air path,

a condenser compartment immediately therebelow including an upward condenser air inlet and a downward outlet, both spacedly below the evaporator air inlet and outlet, whereby such spacing permits through-floor installation with the evaporator air inlet and outlet above such floor and the condenser air inlet and outlet and blower means associated therewith therebelow,

the condenser compartment housing a condenser coil of said components proximately beneath said partition and in the path of air flow from said upward inlet to said downward outlet,

said partition having perforations through it immediately above said condenser coil,

whereby to catch the condensate from the evaporator coil and permit it to drip directly onto the condenser coil.

3,906,741
CHASSIS FOR AN ASSEMBLY

Burton Alexander Terry, 7 Peru Ct., Mount Waverly, Victoria, Australia

Filed Mar. 18, 1974, Ser. No. 451,938
Claims priority, application Australia, Mar. 21, 1973, 2695/73
Int. Cl. F25d 23/12
U.S. Cl. 62—262 22 Claims

1. A chassis for an air conditioner unit comprising:

a molded shell of an expanded plastics material;

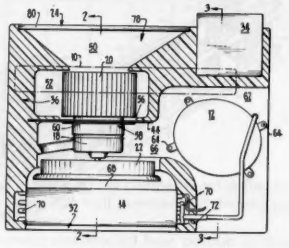
a first passage defined by said shell for the flow of primary air to be cooled;

respective spaced apart primary air inlet and outlet openings in the shell communicating the exterior of the shell with the first passage, the first passage including an intake chamber which converges inwardly of the inlet opening;

a second passage defined by said shell for the flow of secondary air to carry away heat extracted from the primary air flowing in the first passage;

respective secondary air inlet and outlet openings in the shell communicating the exterior of the shell with the second passage;

a structure for detachably and sealingly mounting a motor between the first and second passages with a drive shaft of the motor projecting into each of the passages for driving respective impellers to draw air through the passages, at least one of the primary and secondary air inlet and outlet openings being so formed and disposed as to permit such a motor to be passed therethrough and mounted to said structure, and

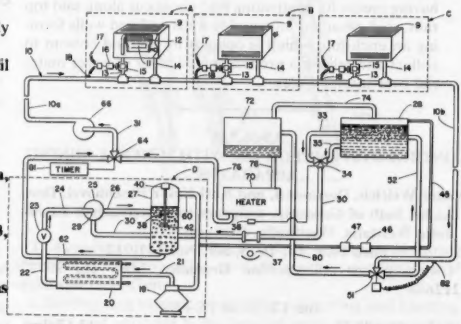


a further opening in the shell communicating the exterior of the shell with the first passage for passing an evaporator therethrough into a disposition transversely of the passage, the further opening being associated with means in the first passage to detachably retain the evaporator in such a disposition.

3,906,742
AIR CONDITIONING SYSTEM UTILIZING ICE SLURRIES

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 312,172, Dec. 4, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,204
Int. Cl.[2] F25B 5/00
U.S. Cl. 62—332 4 Claims



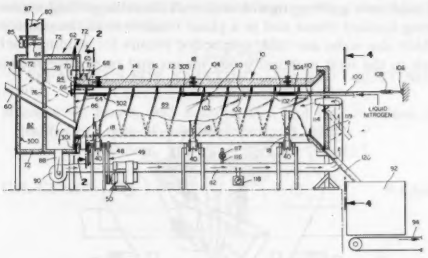
1. A multi-room air conditioning system comprising a plurality of room air conditioning units located in a plurality of zones subject to varying thermal loads, each said conditioning unit including a liquid-to-air heat exchanger; means for producing a chilled heat exchange medium including means for bringing water and a water-immiscible liquid refrigerant, which is incapable of forming a hydrate, into direct contact with each other and evaporating said refrigerant to provide a slurry containing ice crystals; and means for circulating said heat exchange medium to said heat exchangers, said liquid refrigerant providing the carrier for said ice crystals.

3,906,743

REFRIGERATION APPARATUS HAVING A ROTATABLE DRUM

John B. Schorsch, Rydal; William E. Graul, Drexel Hill, both of Pa., and David Barash, Ridgefield, Conn., assignors to The Union Corporation, Verona, Pa.

Filed May 30, 1973, Ser. No. 365,117
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—374 21 Claims



1. A refrigerating means, comprising:

a. a rotatable drum having means to receive and to discharge material; said drum having an interior configuration which further comprises transport means for advancing the material longitudinally within said drum upon rotation of the drum; and wherein the drum is provided with exterior insulation and is supported for rotation on a plurality of rings, said rings have, as part thereof, insulated forced-transmitting members;

b. rotation means engaging said drum for rotating said drum; and

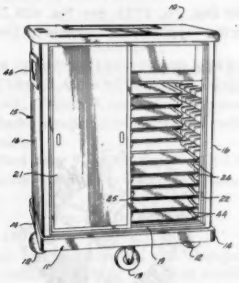
c. refrigeration means within said drum to refrigerate said material while it is within said drum.

3,906,744

PASSIVELY COOLED FLUID STORAGE APPARATUS

Karl K. Knapp, and Delbert R. Reedy, both of Los Angeles, Calif., assignors to Kardel Products Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 253,414, May 15, 1972, Pat. No. 3,800,554. This application Nov. 12, 1973, Ser. No. 415,215
Int. Cl. F25d *3/12*
U.S. Cl. 62—384 9 Claims



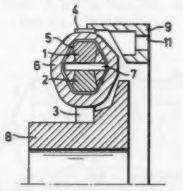
1. An improved food storage assembly and the like comprising a housing defining a cavity therein opening from the housing along one side thereof, door means engageable with the housing across the one side of the cavity for closing the cavity opening, thermal insulation material carried by the housing and the door means for essentially fully enclosing the cavity in the closed position of the door means, a receptacle in the housing in an upper portion of the cavity for receiving a predetermined quantity of latent heat of fusion cooling medium which is other than water ice, a thermally insulated partition disposed horizontally in the cavity immediately below the receptacle subdividing the cavity into a first upper chamber above the partition and a second lower chamber below the partition, and means intimately and thermally conductively associated with the receptacle for thermally coupling the receptacle essentially only by thermal conduction with selected portions of the cavity and including a metal member forming at least the floor of the receptacle for contact directly by cooling medium disposed in the receptacle, the metal member further forming fin means disposed vertically in both the first and second chambers and forming an uninsulated wall common to the receptacle and to the first chamber, the predetermined quantity of cooling medium and the dimensions of the metal member being defined with relation to the type and quantity of the insulation material, to the geometry of the cavity and to the thermal conductivity of the metal member for maintaining the selected portions of the cavity and contents thereof at substantially predetermined temperatures throughout a predetermined period under predetermined ambient temperature conditions.

3,906,745

ELASTIC COUPLING

Werner Faust, Unna, Germany, assignor to Vulkan Kupplungs-und Getriebebau and Bernhard Hackforth, both of, Germany

Filed Mar. 14, 1974, Ser. No. 451,238
Int. Cl. F16d *3/17*
U.S. Cl. 64—11 R 9 Claims



1. An elastic shaft coupling comprising a pair of rigid coupling elements disposed in spaced relation and an annular disk-shaped coupling element positioned between and connected to said coupling components, said coupling element arranged to transmit torque between said coupling components, wherein the improvement comprises that said coupling element comprises a first bending-resistant reinforcement ring, a second bending-resistant reinforcement ring laterally enclosing and spaced radially outwardly from said first reinforcement ring, a plurality of reinforcement inserts securing said first and second reinforcement rings together, each of said reinforcement inserts extending radially around said first and second reinforcement rings, each reinforcement insert comprising a plurality of radially extending loops of a member wrapped around said first and second reinforcement rings and an elastic material embedding said members and enclosing at least a portion of said first and second reinforcement rings.

3,906,746

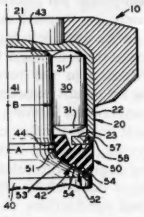
UNIVERSAL JOINT SEALING

Charles W. Haines, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed June 20, 1974, Ser. No. 481,292
Int. Cl.[2] F16D *3/26*
U.S. Cl. 64—17 A 4 Claims

1. In a universal joint comprising a cross with a trunnion at each end thereof, a bearing and bearing cap on each trunnion and a pair of yokes, each connecting an opposite pair of said

caps, the improvement wherein said cross includes a conical shoulder adjacent and sloping outwardly away from each trunnion and a seal comprising a generally cylindrical internal wall, a conical shoulder portion adjacent said wall and sloping outwardly therefrom, said seal shoulder including at least two



concentric circumferential ribs thereon and a radially extending shoulder generally opposite said conical shoulder and including at least two concentric circumferential ribs thereon surrounds said trunnion and sealing engages said shoulder on said cross and said bearing cap.

3,906,747

DOUBLE TRIPOD HOMOKINETIC JOINT

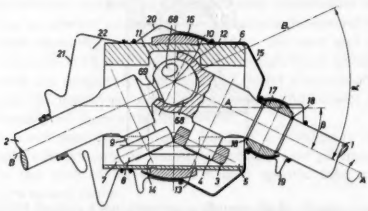
Michel Orain, Conflans-Sainte Honorine, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France

Filed May 30, 1973, Ser. No. 365,236

Claims priority, application France, June 1, 1972, 72.19689

Int. Cl.[2] F16D *3/30*

U.S. Cl. 64—21 **22 Claims**



1. A double tripod homokinetic joint comprising two single tripod homokinetic joints, ball joint centering means providing radial holding of said single tripod joints, a member common to both single tripod joints having closed roller paths of substantially circular cross section for transmitting torque between the two single tripod joints, and at least one of said single tripod joints being otherwise free of said member.

3,906,748

WARP KNITTING MACHINE

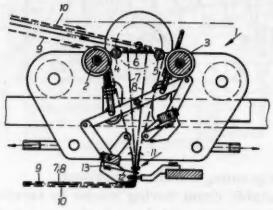
Fery Heilmann, Limbach-Oberfrohna, and Peter Edel, Karl-Marx-Stadt, both of Germany, assignors to Institut fur Textilmaschinen, Karl-Marx-Stadt, Germany

Continuation-in-part of Ser. No. 375,309, June 29, 1972, Pat. No. 3,824,811. This application July 12, 1974, Ser. No. 488,127

Int. Cl.[2] D04B *23/06*

U.S. Cl. 66—84 A **6 Claims**

1. In a warp knitting machine, particularly a stitching machine, comprising a series of pointed knitting needles which operate in a stitching zone, associated with the series of needles at least one laying bar, mounted on the laying bar a series of pointed eye needles, weft laying means located before the stitching zone for laying a continuous length of material in the weft direction, two transport means provided with hooks for receiving the weft material and located at the motion reversal points of the laying means, the laying means comprising means for guiding the weft material and two hold-down means for pressing the weft material into engagement with the hooks at the respective motion reversal points of the laying means, the improvement in which the laying means is adapted for laying at least one web together with at least one set of weft threads as the weft material, the weft material guide means comprises respective means defining a slot for guiding each web and respective means defining at least one opening for guiding each set of weft threads substantially parallel to the web, each of said web guiding means and weft threads guiding means being located above and in a plane transverse to the plane in which the webs are laid, respective means for guiding each web to the weft material guide means and respective means



for guiding each set of weft threads to the weft material guide means and the laying means further comprises mounted for movement with each of the hold-down means a respective retaining means and means for moving each combination of hold-down means and retaining means between an inoperative position when the combination is not adjacent the hooks and in which the hold-down means and the retaining means are positioned above a plane in which the hooks are open and an operative position when the combination is adjacent the hooks and in which the hold-down means is positioned in or on the far side of a plane in which the hooks are open thereby to press the web into the hook openings and the retaining means engages the web between the weft material guide means and the hooks.

3,906,749

WEFT STORAGE DEVICE FOR WARP KNITTING MACHINES

Gunter Frehn, Monchengladbach, Germany, assignor to W. Schlafhorst & Co. Maschinenfabrik, Monchengladbach, Germany

Filed Dec. 26, 1973, Ser. No. 428,232

Claims priority, application Germany, Dec. 27, 1972, 2263561

Int. Cl.[2] D04B *23/06, 23/08, 23/10, 23/12*

U.S. Cl. 66—84 A **4 Claims**

1. Weft storage device for a warp knitting machine having knitting needles at a given location for knitting weft and warp threads into a fabric web, comprising a first and second group of holding members spaced from one another at locations at

which they are respectively adjacent opposite edges of a fabric web that is being knitted in the machine, said holding members being adapted to carry loops of weft threads and having respective axes about which they are rotatable, said holding members being displaceable along a given path in direction toward the knitting needles; and rotary drive means for said holding members, said rotary drive means comprising a plurality of pressure members mounted adjacent said given path and having means for frictionally engaging said holding members so as to produce rotation of said holding members about the respective axes thereof as said holding members are displaced along said given path.

3,906,750

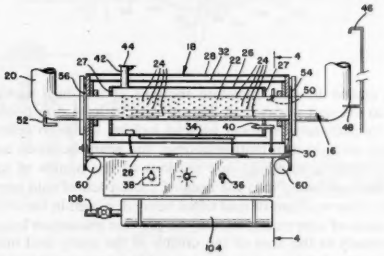
APPARATUS FOR KNITTING AND HEAT-SETTING CIRCULAR KNIT ARTICLES

Herman M. Routh, 365 Bossong Dr., and Otis H. Allen, Sr., Halifax St., both of Asheboro, N.C. 27203

Filed Sept. 10, 1973, Ser. No. 396,017

Int. Cl.[2] D04B *35/00*

U.S. Cl. 66—147 **9 Claims**



1. Apparatus for heat setting the stitches of a circular knit article upon discharge of the article from the knitting instrumentalities of a circular knitting machine comprising; means defining a stationary chamber having an inlet and an outlet with closure means for each for receiving the knit article, means for applying heat to the knit article within said chamber to effect heat setting of the stitches thereof, means for conveying the knit article from the knitting machine to said chamber upon discharge from the knitting instrumentalities and from said chamber after heat setting of the article stitches, means for urging the knit article in a direct path of travel in said conveying means controlled from said knitting machine, and means for selectively controlling the opening and closing of said closure means of said chamber.

3,906,751

APPARATUS FOR WITHDRAWING KNIT WORK FROM CIRCULAR KNITTING MACHINE

Otokar Chladek, Trebic, Czechoslovakia, assignor to Elitex, avody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia

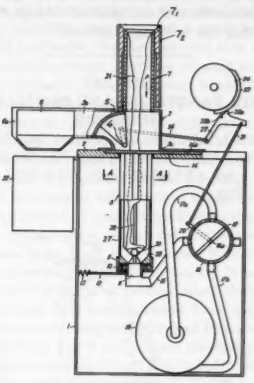
Filed June 9, 1972, Ser. No. 261,549

Claims priority, application Czechoslovakia, June 10, 1971, 4238-71

Int. Cl. D04b *15/88*

U.S. Cl. 66—149 S **7 Claims**

1. apparatus for withdrawing and transporting knitwork from circular knitting machine having an axial needle cylinder defining a knock over plane at one end comprising a plenum chamber located below said knock over plane, a first conduit for passage of said knitwork axially arranged with said cylinder and having an upper end below the plenum chamber, means located at the lower end of said first conduit for arresting the passage of said knitwork therethrough, a second conduit for passage of said knitwork intersecting said plenum chamber above said first conduit and arranged transversely of the axis of said cylinder, means for causing a flow of air through said conduits and for selectively changing the direction of said air flow, a flap pivotally mounted within said



plenum chamber to selectively occlude one or the other conduits against passage of said knitwork with respect to said knock over plane and means for pivoting said flap.

3,906,752

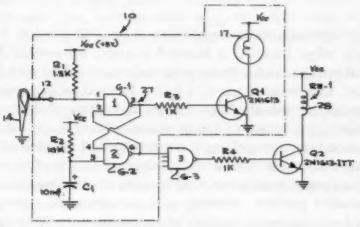
LATCH DETECTOR STOP MOTION SYSTEM FOR CIRCULAR KNITTING MACHINES

Peter C. Eichhorst, 302 Shady Dr., Inman, S.C. 29349

Filed Mar. 7, 1974, Ser. No. 449,066

Int. Cl.[2] D04B *35/18*

U.S. Cl. 66—157 **13 Claims**



1. A stop motion device for detecting closed needle latches of needles moving through a test station near a yard feed station in a circular knitting machine wherein the needles and their latches conductively communicate with electrical ground and the latches in the region of said test station move along a normal path when in open position and move along an abnormal path when in undesired closed position, comprising a normally ungrounded electrically conductive contact probe disposed adjacent said test station at a location along said abnormal path to conductively contact any closed latch and momentarily establish an electrical grounding path from the probe through the closed latch, a bistable flip-flop circuit having first and second input terminals, the first input terminal being connected to said probe to be momentarily connected directly to ground through the probe and closed latch when the probe contacts a closed latch, said flip-flop circuit having connection means including means connecting supply voltage to the first input terminal to set the flip-flop circuit upon application of supply voltage thereto to a ready first state wherein a normal first voltage state is provided at an output thereof and wherein the flip-flop is conditioned to respond to momentary connection of its first input terminal to ground to shift the flip-flop to a second state causing said output to

instantaneously change to a second voltage state, and a relay control circuit including a relay for stopping the knitting machine and circuit connections to said flip-flop output responsive to occurrence of said second voltage state to activate the relay to stop the knitting machine.

3,906,753

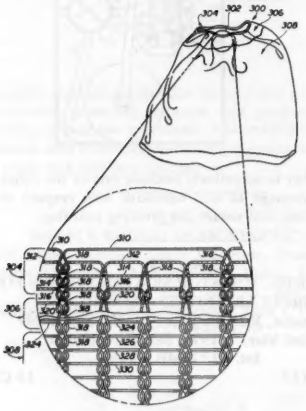
FOOTLETS, PANTYHOSE AND PROTECTIVE BAG THEREFOR

George Siegfried, P.O. Box 128, Milton, Del. 19968

Filed Mar. 14, 1973, Ser. No. 341,018

Int. Cl.[2] D04B *1/18, 1/24, 9/24*

U.S. Cl. 66—170 **8 Claims**



1. A knitted article comprising a beaded portion forming the top edge thereof, a banded portion connected to said beaded portion and a body portion connected to said banded portion, said beaded portion being formed of approximately four to approximately eight courses consisting of alternate and intermediate courses of Lycra spandex yarn, each said intermediate course comprising a predetermined number of loops, each said alternate course comprising a fraction of said predetermined number of loops, said courses alternating throughout the beaded portion, starting with an alternate course, said banded portion being formed of approximately 50 to approximately 200 courses consisting of a second plurality of alternate and intermediate courses of a slightly elastic yarn, each said intermediate course of said banded portion comprising a determined number of loops, each said alternate course of said banded portion comprising a fraction of said determined number of loops, and said body portion comprising a third plurality of courses of said slightly elastic yarn, each of the courses of said body portion including said predetermined number of loops.

3,906,754

PANTY AND PARTS THEREOF AND METHOD OF MANUFACTURE

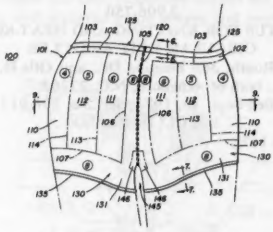
Lester M. Sackman, Fayetteville, Ark., assignor to Bear Brand Hosiery Co., Chicago, Ill.

Filed Feb. 8, 1974, Ser. No. 440,788

Int. Cl.[2] A41B *9/02, 9/04, 9/10*

U.S. Cl. 66—177 **23 Claims**

1. A panty comprising two knitted tubes slit longitudinally from one end thereof to a point adjacent to but spaced from the other end thereof and having corresponding edges seamed together, each tube being seamless unidirectional rotary knitted and including a plurality of integrally knitted panels extending circumferentially therearound, one section of each of said panels having a predetermined number of courses therein and at least one of said predetermined courses terminating in a free end adjacent to at least one other section of each of said panels to provide fewer courses therein than the predetermined number, whereby said other sections having fewer courses therein have a normal length longitudinally of said tube less than that of said one sections having the predetermined number of courses therein, and a transition section disposed between each of said one sections and the adjacent other section wherein the courses present in said one sections and not present in said other sections terminate, each terminating course in said transition sections ending in a locking stitch to prevent unraveling thereof with at least one floated stitch immediately adjacent to said locking stitch to relieve pressure on said terminating course, the seam between said tubes extending into said one sections of the panels of said tubes and extending into the area of the crotch of said panty and the other sections of said tubes being disposed in the outer thigh areas of said panty, thereby to provide maximum length of the panty in the area of the crotch of the panty and minimum length of the panty in the area of the outer thighs of the panty.



3,906,755

APPARATUS FOR A CONTINUOUS TREATMENT OF TEXTILE FIBER GOODS

Yoshikazu Sando; Takashi Tsuchihashi; Masao Takasu, and Hiroshi Ishidoshiro, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Continuation of Ser. No. 184,809, Sept. 29, 1971, abandoned, which is a division of Ser. No. 55,204, July 15, 1970, abandoned. This application Mar. 1, 1973, Ser. No. 337,122

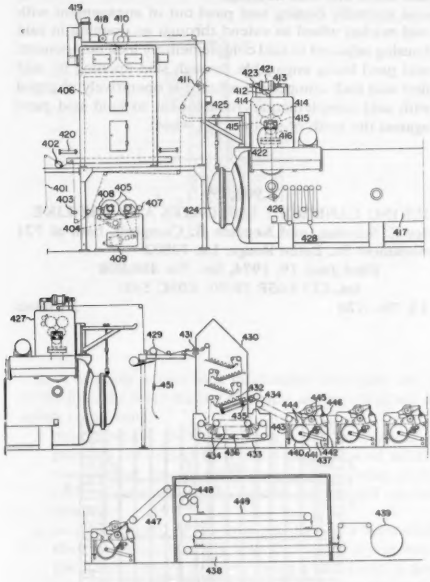
Claims priority, application Japan, July 28, 1969, 44-59457; Sept. 13, 1969, 44-72879; Sept. 22, 1969, 44-75413; Oct. 2, 1969, 44-78748; Oct. 7, 1969, 44-80137; Oct. 9, 1969, 44-80878; Oct. 9, 1969, 44-80879; Nov. 27, 1969, 44-95289

Int. Cl.[2] D06B *13/00*

U.S. Cl. 68—3 SS **1 Claim**

1. An apparatus for the continuous treatment of cloth in a high pressure steamer comprising means for moving the cloth continuously along a path of travel, means forming a high pressure chamber located in the path of travel of the cloth, said high pressure chamber having an inlet opening and an outlet opening for guiding the cloth into and out of said chamber, pressure sealing apparatus located at the inlet opening and outlet opening of said chamber, at least one non-tension washer including a tube located downstream from said chamber in the path of travel of the cloth, guide rolls associated with said washer for directing the cloth into and out of said tub, squeeze rolls located within said washer and in the path of the cloth as it leaves the tub and downstream of said guide rolls, dancer rollers for adjusting the tension in said cloth, at least one cloth expander in the path of the cloth downstream from said tub, a steaming tank positioned in the path of travel of the cloth between said high pressure chamber and said washer, means within said steaming tank for relaxing the cloth, said means for relaxing the cloth comprising a multi-stepped vibrating chute, said multi-stepped vibrating chute

comprising a plurality of chutes arranged one below the other so that the cloth being treated moves downwardly from one chute to the next in a plaiting condition, each said chute includes a spring mounting the chute and a motor associated with said spring for vibrating the chute, a boiling tank forming the lower end of said steaming tank and containing a solution for treating the cloth, said boiling tank located below the lower end of said vibrating chute for receiving the cloth after



its passage through the lowermost one of the chutes in said multi-step vibrating chute, a pair of horizontally arranged conveyers located in said boiling tank with one located below the other so that the cloth passes beween and in contact with said conveyers for completing the relaxation finish, and a vibrating lever disposed in operative association with the lower one of said conveyers for applying a rubbing action to the cloth as it passes between said pair of conveyers.

3,906,756

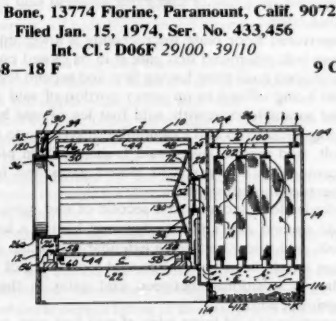
DRAPERY AND SHEET MATERIAL CLEANING MACHINE

Aubra N. Bone, 13774 Florine, Paramount, Calif. 90723

Filed Jan. 15, 1974, Ser. No. 433,456

Int. Cl.[2] D06F *29/00, 39/10*

U.S. Cl. 68—18 F **9 Claims**



1. A machine for cleaning sheet materials such as draperies and the like by the use of a plurality of abrading particles that are carried by a stream of air at not greater than ambient pressure and said particles serving as a carrier for a cleaning agent and said particles being recovered after they have served to clean said sheet material, said machine including:

a. a housing assembly that includes a horizontal top, first and second end walls, first and second side walls, a base frame secured to lower portions of said end walls and sidewalls, a horizontal first base plate secured to said base frame and extending between said end walls and sidewalls, a transverse vertical first partition intermediate said first and second end walls that divides the interior of said housing above said base plate into first and second compartments and the portion of said housing beneath said base plate and under said second compartment into a third compartment, a second horizontal base plate that closes the lower portion of said third compartment, a first horizontal tubular shell that extends inwardly into said first compartment from a first opening in said first end wall, a second horizontal tubular shell that extends inwardly into said first compartment from said first partition and is coaxially aligned with said first shell, a second vertical partition and a pair of end pieces that cooperate with the upper portion of said first tubular shell, said first end wall and said top to define a fourth compartment, said second partition having a second opening therein, and said first tubular shell having a third opening therein that is in communication with the interior of said fourth compartment;

b. a first door movably supported from said first end wall for closing said first opening during the cleaning of said sheet material;

c. a rotatable, cylindrical, substantially horizontal drum situated in said first compartment, said drum including first and second end pieces, said first end piece having a fourth opening formed therein through which said first tubular shell extends, said second end piece having a fifth opening therein, and said drum including a third tubular shell that is axially aligned with said second tubular shell, with said third tubular shell supported from said second end piece and in communication with said fifth opening therein;

d. first means for rotatably supporting said drum in said first compartment;

e. second means for effecting a movable seal between said first tubular shell and said first end piece of said drum;

f. third means for effecting a movable seal between said second and third tubular shells as said drum rotates;

g. fourth power operated means for rotating said drum with said sheet material therein;

h. fifth power operated means that tend to maintain a negative pressure in said second compartment;

i. a plurality of spaced vertically disposed tubes that extend upwardly from openings in said first base plate into said second compartment;

j. a plurality of vertically disposed filter bags situated in said second compartment, said bags having lower open ends that sealingly engage said tubes, and said bags having closed upper ends;

k. sixth spring means that support said closed upper ends of said bags adjacent said top of said housing;

l. seventh means for vibrating said sixth means and said bags to cause said particles adhering to the interior surfaces of said bags to loosen therefrom and drop downwardly by gravity into said third compartment;

m. a drawer in said third compartment for catching said particles that drop downwardly from said bags;

n. a second door pivotally supported from said second partition, said second door when in a first position closing said second opening, but said second door when there is a negative pressure in said second compartment tending to pivot to a second position to permit air to flow through said second and third openings and longitudinally through said drum as a stream to free said sheet material in said drum of particles

o. eighth means for limiting the pivotal movement of said second door to a specific second position where said air flows through said second and third openings and said drum to said second compartment as a stream at a desired velocity and for locking said door in a closed position; and

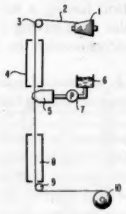
p. ninth means for preventing said stream of air flowing through said drum carrying said sheet material longitudinally therein to the extent that said sheet material enters said third tubular shell and clogs the latter.

3,906,757

APPARATUS FOR CONTINUOUS DYEING OF YARNS

Heiji Arimoto, Kyoto; Tokuji Goto, Uji; Kunio Amemiya, Uji, and Tunekatu Seki, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Division of Ser. No. 262,846, June 14, 1972, Pat. No. 3,808,618. This application Nov. 2, 1973, Ser. No. 412,520
Claims priority, application Japan, June 14, 1971, 46-42316
Int. Cl.[2] D06B *1/08;* **D06P** *5/00*
U.S. Cl. 68—20 **2 Claims**



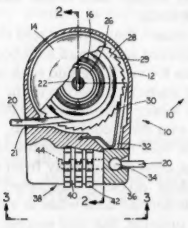
1. An apparatus for continuously dyeing a yarn comprising means for providing a running yarn, means for heating said running yarn, means for applying a dye to said running yarn, means for drying said dyed yarn and means for winding up said dyed yarn; said means for applying a dye comprising a plurality of dye applicators disposed in sequence along said running yarn and angularly offset from each other about said yarn, each of said applicators having a U-shaped groove, a dye discharging aperture disposed at the bottom of said groove and means for supplying a dye through said aperture.

3,906,758

COMBINATION CABLE LOCK

Ronald Hurwitt, 3 Vista Wood, San Rafael, Calif. 94901

Filed July 29, 1974, Ser. No. 492,418
Int. Cl.[2] E05B *37/02, 65/52, 67/06, 73/00*
U.S. Cl. 70—30 **5 Claims**



1. A cable lock comprising:

a housing;

a reel rotatably carried in said housing;

a ratchet wheel coaxially carried on said reel;

a cable wound on said reel and extending outside of said housing;

a first component of a separable combination lock device on the end of said cable;

the complementary component of said separable lock device being carried on the housing;

a pawl on said housing engagable with said ratchet wheel to enable rotation thereof only in the direction to retract said cable into said housing;

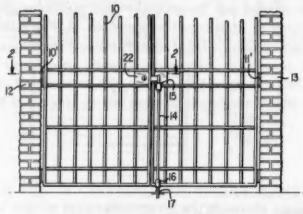
means normally biasing said pawl out of engagement with said ratchet wheel to extend through an opening in said housing adjacent to said complementary lock component; said pawl being engagable through said opening by said first said lock component when it is operatively engaged with said complementary component to hold said pawl against the teeth of said ratchet wheel.

3,906,759

LOCKING CANE BOLT FOR GATES AND THE LIKE

Charles E. Schwing, and Kenneth B. Campbell, both of 721 Government St., Baton Rouge, La. 70802

Filed June 19, 1974, Ser. No. 480,808
Int. Cl.[2] E05B *59/00;* **E05C** *5/00*
U.S. Cl. 70—128 **2 Claims**



1. A gate lock for locking together a pair of hinged, swinging gates, each of said gates being hinged at an outer edge portion and having inner edges adjacent each other when said gates are in a closed position, said gate lock comprising in combination:

an elongated vertically slidable and rotatable cane bolt mounted on a first of said gates adjacent said first gate's inner edge;

an apertured floor plate for receiving a lower end of said cane bolt when said first gate is in its closed position;

an L-shaped hasp plate having first and second leg portions and being affixed to an upper portion of said cane bolt and rotatable therewith, said first leg of said hasp plate being secured to and extending transversely to said cane bolt, said second leg of said L-shaped hasp plate being positionable between said closed gates and having an aperture therethrough;

a cylinder lock secured to a second of said gates adjacent said second gate's inner edge, and having a long throw bolt, said throw bolt being extendable through said aperture in said hasp plate when said second leg of said hasp plate is positioned between said gates in their closed position; and,

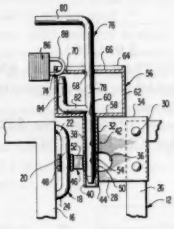
an aperture in said inner edge of said first gate, said throw bolt being extendable through said hasp plate aperture and into said aperture in said inner edge of said first gate to lock said gates in their closed position.

3,906,760

MULTIPLE ACCESS LOCK

Bill T. Parker, Jr., Pleasanton, Tex. 78064

Filed July 25, 1974, Ser. No. 491,682
Int. Cl.[2] E05C 5/00; E05B 63/02
U.S. Cl. 70—154 2 Claims



2. A multiple access lock mechanism for a gate and fence or the like, the fence having a vertical anchor cleat, the mechanism comprising:

a double sleeve member having a pair of vertical sleeve portions connected by a cross tab in spaced relation to one another, one of said sleeve portions being journaled on the vertical anchor cleat for pivotal movement thereon;

a bracket secured to the gate and having a horizontal slot therein aligned laterally with the double sleeve member, the double sleeve member being pivotal into a position wherein the other sleeve portion occupies the slot when the gate is closed;

a pair of tubular slideway members secured to the bracket, including an upper slideway member above said slot and a vertically aligned lower slideway member below the slot, the slideway members having co-aligned passageways formed therein;

a cup member fixedly secured to the bracket and the upper slideway member, including a base having an opening therein aligned with the passageways of the slideway members, a side wall with an upper edge, and a top wall; the top wall of the cup member further having an aperture formed therein in alignment with the opening in the base and with the passageways;

the top wall of the cup member being recessed and having a plurality of radially arranged chambers therein extending inwardly from its periphery;

the side wall having slits therein in alignment with the respective chambers of the top wall and spaced downwardly from the upper edge of the side wall;

a slidable bolt including an elongated main stem riding in the passageways and extending through the base opening and the aperture of the top wall;

an operating handle on the main stem, the stem being engageable through the other of said sleeve portions of the sleeve member;

a horizontal arm on the main stem in said cup member between the base and the top wall thereof; and

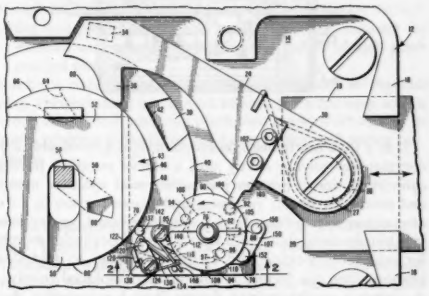
a vertical lug bar on the horizontal arm, said lug bar being alignable for movement through a selected one of the chambers to permit lifting of the main stem out of engagement with the said other sleeve portion, and a padlock including a loop releasably extended through the slit and chamber to block movement of the lug bar to prevent unauthorized opening of the gate.

3,906,761

DISABLING MECHANISM FOR A COMBINATION LOCK

Frank H. Swaim, 9012 Sudbury Rd., Silver Spring, Md. 20901

Filed Aug. 26, 1974, Ser. No. 500,721
Int. Cl.[2] E05B 37/08
U.S. Cl. 70—333 R 18 Claims



1. A disabling device for improving the security of a combination lock of the type having tumbler means including gates and a fence movable into said gates when the proper combination has been entered into said lock, and a fence lever operable by a particular manipulation of said tumbler means to operate a lock bolt or the like to open said lock, said device comprising:

sensing means operable by said tumbler means for sensing each said particular manipulation of said tumbler means and thereby each attempt to open said lock,

register means operated by said sensing means for registering successive of said particular manipulations which result in unsuccessful attempts to open said lock,

fence lever disabling means operated by said register means for disabling said fence lever when a predetermined number of successive of said particular manipulations which result in unsuccessful attempts to open said lock have been registered by said register means, and

reset means operated by said tumbler means for resetting said register means and said fence lever disabling means so that said fence lever is again rendered operable and said lock can respond to the proper combination.

16. A method of operating a combination lock of the type having tumbler means including gates and a fence movable into said gates when the proper combination has been entered into said lock and a fence lever operable by a particular manipulation of said tumbler means to operate a lock bolt or the like, said method comprising:

sensing each said particular manipulation of said tumbler means,

registering successive of said particular manipulations of said tumbler means which do not result in successful opening of said bolt means or the like,

disabling said fence lever upon the registration of a predetermined number of said successive of said particular manipulations that do not result in successful opening of said bolt means or the like, whereby said lock cannot be opened,

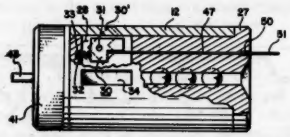
entering a reset combination into said tumbler means to prepare to enable said fence lever, and

enabling said fence lever by performing said particular manipulation of said tumbler means after said reset combination has been entered.

3,906,762
KEY TRAP

Keith L. Austin, 4620 Brown St., Murray, Utah 84107, and Harper K. Morris, 2211 Karo, Idaho Falls, Idaho 83401

Filed Sept. 21, 1973, Ser. No. 399,386
Int. Cl. E05b *11/06*
U.S. Cl. 70—390 **10 Claims**

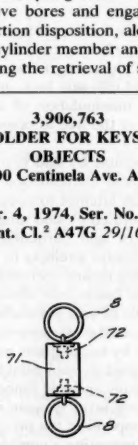


1. In a lock mechanism, in combination, a revolvable cylinder member having a key slot; a sleeve member having a cylindrical sleeve portion journalling said cylinder member and means for fixedly retaining said sleeve portion in a fixed disposition; spring-biased catch means, pivoted for movement in a longitudinal plane with respect to said cylinder member, for releasably locking said cylinder member to said sleeve portion when the former is rotationally displaced relative to the latter a predetermined degree from key-insertion disposition, said sleeve and said cylinder member each including mutually spaced, respectively aligned, radially oriented pin bores; plural key-detent pins operatively disposed in said cylinder member bores; spring-biased base pins respectively disposed in said sleeve bores and engaging said key-detent pins, at said key-insertion disposition, along the arcuate juncture defined by said cylinder member and said sleeve portion; and means for enabling the retrieval of said catch means.

3,906,763
SEPARABLE HOLDER FOR KEYS AND SIMILAR OBJECTS

Michael Bochory, 5000 Centinela Ave. Apt. 106, Los Angeles, Calif. 90066

Filed Mar. 4, 1974, Ser. No. 447,509
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 R **9 Claims**

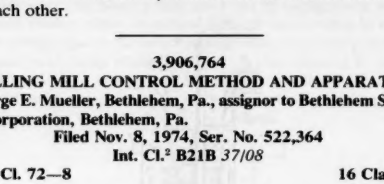


1. A separable holder for keys and similar objects, comprising a first member formed with a passage bounded by an inner circumferential surface of circular outline which is concentric with a first axis; a second member having an outer peripheral surface of circular outline removably received within the confines of said inner circumferential surface and concentric with a second axis which is parallel to said first axis when said members are in one angular position relative to one another; cam means operatively associated with said members for moving one of said members radially with reference to the other member with a concomitant change in the spacing between said axes, in response to rotational displacement of said members relative to one another out of said one angular position, whereby portions of said surfaces are wedged into strong frictional engagement when said members are rotationally displaced relative to one another in one direction, and are moved out of such frictional engagement when said members are rotationally displaced relative to one another in the opposite direction so as to permit separation of said members; and a pair of rigid annular planar holding means respectively provided on said members for engaging and holding objects which are to be separably connected with each other, the planes of said rigid annular planar holding means being mutually parallel when said members are displaced in said one direction and mutually perpendicular when said members are displaced in said other opposite direction, whereby said rigid annular planar holding means provides an affirmative grip to facilitate the rotational displacement of said members relative to each other.

3,906,764
ROLLING MILL CONTROL METHOD AND APPARATUS

George E. Mueller, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 8, 1974, Ser. No. 522,364
Int. Cl.² B21B *37/08*
U.S. Cl. 72—8 **16 Claims**



1. In a method of automatically controlling rolling mill roll gap where a preset roll gap is adjusted in response to a roll gap reference signal, the improvement which comprises:

a. establishing a lock-on AGC control mode when the head-end of said material enters the mill rolls, including:

1. storing lock-on values of mill stretch and roll position signals generated during rolling of said material, and
2. thereafter adjusting roll gap to maintain material thickness according to a roll gap reference signal which is produced in response to changes in said mill stretch and roll position signals after lock-on,

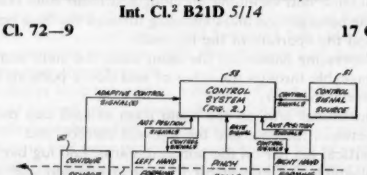
b. producing a lock-on thickness error signal by comparing an aim gage signal with said stored lock-on values of said mill stretch and roll position signals, and

c. correcting the roll gap reference signal by a predetermined amount of the lock-on thickness error signal to cause the production of rolled material having absolute aim gage.

3,906,765
NUMERICALLY CONTROLLED CONTOUR FORMING MACHINE

Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 20, 1974, Ser. No. 525,584
Int. Cl.² B21D *5/14*
U.S. Cl. 72—9 **17 Claims**



1. An N/C contour forming machine with adaptive control comprising:

pinch rolls for moving a part to be contour formed through said N/C contour forming machine;

at least one forming roll, said at least one forming roll position adjustable along at least one axis, the position of said at least one forming roll controlling the contour of a part as it is moved through said N/C contour forming machine by said pinch rolls;

a contour sensor, said contour sensor sensing the contour of a part as it emerges from said N/C contour forming machine and generating at least one adaptive control signal related to said contour; and

a control system, said control system: receiving numerical control signals suitable for controlling the position of said at least one forming roll along its at least one position adjustable axis; receiving said at least one adaptive control signal generated by said contour sensor; and, modifying said received numerical control signals by multiplying said received numerical control signals by a multiplication factor (k) determined in accordance with the following algorithm:

$$k = k_0 + \left[\frac{q_0}{q_1} - 1\right]$$

where:

k_0 equals the preceding correction factor;

q_0 equals a contour reference value related to the contour of the part being contour formed and computed from part geometry, said contour reference value forming a portion of said received numerical control signals; and

q_1 equals the contour sensed by the contour sensor.

3,906,766

METHOD FOR PRODUCING COIL SPRINGS

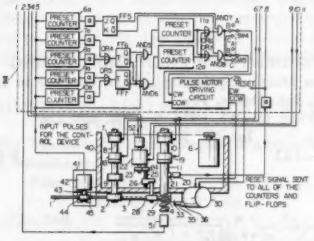
Takashi Sato, Hachioji, Japan, assignor to Kabushiki Kaisha Sato Spring Seisakusho, Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,422

Claims priority, application Japan, July 26, 1973, 48-83622

Int. Cl.[2] B21B *37/00;* **B21F** *11/00*

U.S. Cl. 72—12 **9 Claims**



1. An improved method for producing coil springs in which an electrical pulse is generated each time a predetermined length of wire material is fed through a wire feeding mechanism, a number of said pulses being applied to a wire length control circuit included in a control device, and the output of said wire length control circuit emitted at the time a predetermined number of said pulses are applied to said circuit is utilized for stopping the movement of the wire feeding device and for starting the movement of a cutting device, wherein said improvement comprises the steps of:

a. applying said electric pulses to a pitch control circuit also included in said control device;

b. emitting phase output pulses from said pitch control circuit for a period during which a pitch increasing portion of the coil spring is produced;

c. utilizing said phase output pulses for advancing a pitch forming tool a predetermined distance for each of said output pulses of said pitch control circuit, whereby a required pitch increase is obtained in the coil spring;

d. suspending the emission of output pulses from said pitch control circuit for a period during which a constant pitch portion of the coil spring is produced, whereby said pitch forming tool is so securely held that pitches of the constant pitch portion of the coil spring are reliably uniform;

e. emitting opposite phase output pulses from said pitch control circuit for a period during which a pitch decreasing portion of the coil spring is produced;

f. and utilizing said opposite phase output pulses for retracting said pitch forming tool a predetermined distance for each of said opposite phase output pulses of said pitch control circuit,

whereby a required pitch decrease is obtained in the coil spring, reciprocating movement of said pitch forming tool is thereby completed, and said pitch forming tool returns to its original position to be ready for a succeeding coil spring production.

3,906,767

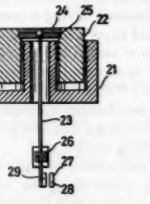
HYDRAULIC ROLL-GAP CONTROL SYSTEM

Shigeo Tanaka; Kazuyoshi Hashimoto, both of Hiroshima; Toshiharu Takatsu, Iwakuni; Mitsuhiro Abe, Hiroshima; Hidetaki Sada, Hiroshima, and Katsusuke Kawanami, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed May 31, 1974, Ser. No. 475,276

Int. Cl.[2] B21B *37/08*

U.S. Cl. 72—21 **2 Claims**



1. In a roll-gap control mechanism for a rolling mill including a plurality of rolls defining between a pair of said rolls a roll-gap through which a workpiece is fed,

said control mechanism including:

an hydraulic piston-and-cylinder assembly comprised of a stationary member fixed relative to said rolling mill and a movable member connected to move in accordance with relative movement of said rolls to vary the size of said roll-gap,

a position rod fixed to said movable member and

sensing means for generating a control signal indicative of variations in said roll-gap in response of movement of said position rod,

the improvement wherein:

said stationary member is configured as a generally upwardly opening cupped member including

an upstanding outer annular wall,

an upstanding inner annular wall located radially inwardly of and generally concentrically with said outer annular wall,

a centrally located open-ended hole extending through said stationary member defined and surrounded by said inner annular wall, and

an annular trough defined between said inner and outer annular walls;

said movable member is configured as a generally downwardly opening cupped member including a depending annular wall extending within said annular trough in sealed sliding engagement between said upstanding inner and outer annular walls; and

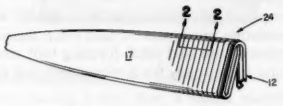
said position rod extends from fixed engagement with said movable member to said sensing means through said centrally located hole.

3,906,768

BAND MAKING APPARATUS

John F. Papa, Jr., Cranston, R.I., assignor to Evinger Corporation, Providence, R.I.

Filed Jan. 28, 1974, Ser. No. 437,139
Int. Cl.[2] B21J 7/46; B21F 11/00
U.S. Cl. 72—22 9 Claims



1. Band making apparatus for making a flattened, helically wound band, comprising

a blade-shaped mandrel having an axis and a free end,

a source of wire,

guide and control means for presenting said wire to said mandrel,

means for rotating said mandrel about said axis to cause said wire to be wound about said mandrel, causing successive turns of said wire on said mandrel to form said band,

means for continuously feeding the completed band along said axis and off said free end of said mandrel,

a cut-off mechanism having a cutting blade with a cutting edge mounted beyond said free end of said mandrel along the direction of said axis to receive from said mandrel and cut through said completed band and automatically successively cut off band segments of predetermined length, said cut-off mechanism including means for moving said cutting blade along a line non-parallel to said cutting edge during a cutting stroke, and

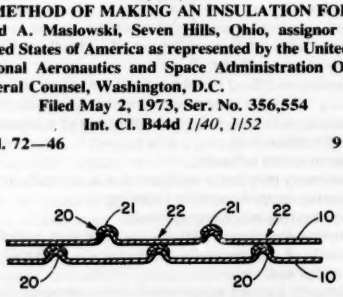
timing means responsive to the rotational position of said mandrel for controlling the operation of said cut-off mechanism to move said cutting blade through its cutting stroke while said mandrel is rotating and when the broad side of said band to be cut is within 30° of being perpendicular to said line.

3,906,769

METHOD OF MAKING AN INSULATION FOIL

Edward A. Maslowski, Seven Hills, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel, Washington, D.C.

Filed May 2, 1973, Ser. No. 356,554
Int. Cl. B44d 1/40, 1/52
U.S. Cl. 72—46 9 Claims



1. A method of producing self-separating, thermally-insulating, reflective sheets comprising the step of:

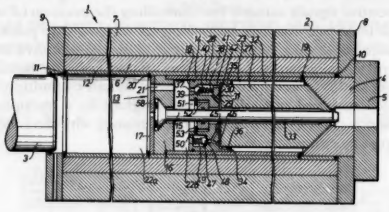
depositing a molten ceramic material onto a plurality of spots on a reflective metallic sheet having a thickness such that thermal stresses occur at each spot to produce a protuberance substantially covered with a ceramic coating.

3,906,770

EXTRUSION PRESS FOR HYDROSTATIC EXTRUSION WITH A BILLET-HOLDING PISTON IN THE PRESSURE CHAMBER

Per Wrammerfors, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 30, 1974, Ser. No. 511,303
Claims priority, application Sweden, Oct. 12, 1973, 7313873
Int. Cl.[2] B21C 25/04
U.S. Cl. 72—60 3 Claims



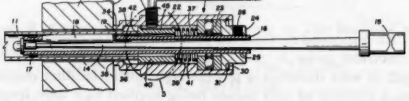
1. Press for hydrostatic extrusion of tubes comprising a press stand, a pressure chamber comprising a high-pressure cylinder displaceably arranged in the press stand, a die sealing one opening of the cylinder, said die having an opening for forming a profile, and a punch insertable in the other opening of the cylinder for generating a pressure within a pressure medium enclosed in the pressure chamber and surrounding a billet for extrusion of the billet, a mandrel arranged in the pressure chamber, a piston-like billet holder dividing the pressure chamber into two spaces and having an opening for the mandrel, said piston holding the billet and the die pressed against a die support while the pressure chamber is being closed, the billet-holding piston including a first portion having an opening adjusted to the mandrel and a second portion having an outer diameter fitting within the pressure chamber, the second portion having a bore therein of an internal diameter greater than the external diameter of the first portion, whereby the first portion is radially displaceable in relation to the second portion.

3,906,771

EXPANDER FOR RANDOM TRIM TUBING

Paul Warren Martin, Springfield, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 17, 1974, Ser. No. 489,226
Int. Cl.[2] B21D 39/06
U.S. Cl. 72—122 9 Claims



1. In a tube expander for expanding an axially positioned tube to a header sheet beyond which the tube end is projecting and including a rotatable tubular cage for insertion in a tube end to be expanded, forming rollers contained in the outer periphery of said cage and a rotatable tapered mandrel within said cage for driving said cage and rollers in an expanding relation to the tube end, the combination therewith of:

a. a non-rotatable tubular thrust collar operatively supported on said cage at a predetermined secured location displaced from said rollers, said collar having an inlet in which to receive the projecting end of a tube in which

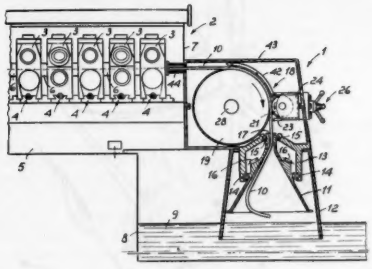
said cage is inserted and being movable thereover past the tube end toward the face of the header sheet; and

b. a stop sleeve slideably supported on said cage internally of said collar and abuttable against the end face of the received tube to be arrested by the tube end against movement together with said collar.

3,906,772
GUIDE DEVICE FOR WIRE ROD

Giulio Properzi, Via Pietro Cossa 1, Milan, Italy (20122)

Filed Nov. 19, 1973, Ser. No. 417,343
Int. Cl.² B21B 39/20
U.S. Cl. 72—251 4 Claims

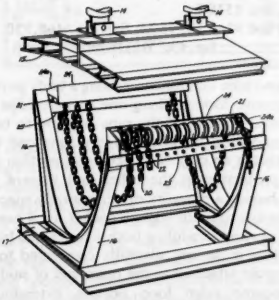


1. A device for guiding hot wire rod at the outlet of a rolling mill from which the wire rod comes out in a substantially horizontal direction to a coiler having an axis forming an angle with said substantially horizontal direction, the device comprising movable guide means arranged between the rolling mill outlet and the coiler and contacting the wire rod along at least an arcuate path thereof extending tangentially to said substantially horizontal direction and said axis, and means for driving said movable guide means in contact with the wire rod at a spead substantially equal to that of the wire rod between the rolling mill outlet and the coiler, wherein said guide means include at least one peripherally grooved guiding disc having a radius substantially equal to the radius of curvature of said arcuate path and at least a second rotatable disc having a peripheral groove and a radius substantially less than that of said guiding disc, said second disc being arranged substantially tangential to said guiding disc and being rotated at a peripheral speed substantially equal to that of said guiding disc.

3,906,773
MACHINE FOR MAKING PIPE-ARCH FOR CULVERTS BY DEFORMING PIPE

Joe C. Fitz, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed May 13, 1974, Ser. No. 469,704
Int. Cl.² B21D 5/02
U.S. Cl. 72—380 13 Claims

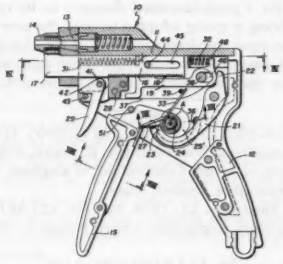


1. A machine for deforming pipe into pipe-arch which comprises: a base; side columns fixed to said base; a top frame fixed to said side columns; a top die mounted on said top frame; side frames on said base movable towards one another; restraining means on said side frames adapted to be engaged by pipe as such pipe is deformed; a plurality of chains suspended from said side frames so as to form a curve, said chains being adapted to receive pipe to be deformed; means to change the effective curve of said suspended chains relative to the selected position of said restraining means; and means to effect relative movement between said top die and said chains so as to deform the pipe into pipe-arch.

3,906,774
RIVET GUN

Gabriel M. LaPointe, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.

Filed June 21, 1974, Ser. No. 481,487
Int. Cl.² B21J 15/34
U.S. Cl. 72—391 8 Claims



1. A rivet gun for use with a tubular rivet having a mandrel, comprising:

a. a main body having a handle and a grip for grasping the mandrel,

b. a rivet anvil mounted to movement away from the main body,

c. a squeeze lever pivotally mounted on the main body and located adjacent the handle, and

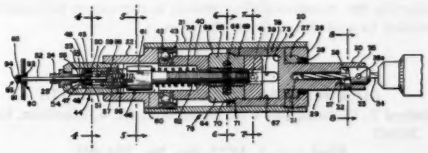
d. a ratchet mechanism mounted in the housing and joining the lever to the anvil,

wherein the ratchet mechanism includes a ratchet member slidable in the housing, having ratchet teeth and being connected to the anvil, and wherein a pawl member is also slidable in the housing for engagement with the ratchet teeth and is operated by the lever.

3,906,775
RIVETER HAVING AXIALLY LATCHABLE CLUTCH

Eliezer Benimetzki, c/o Brilliant Lighting Fixture Corporation, 12 W. 31st St., New York, N.Y. 10001

Filed June 21, 1974, Ser. No. 481,872
Claims priority, application Israel, July 1, 1973, 42637
Int. Cl.² B21J 15/34
U.S. Cl. 72—391 2 Claims



1. In a riveting device for a blind rivet having a mandrel, such device comprising a tubular housing, means for converting rotary power of a drive shaft to a cycle of axially shifting an internal member, a chuck adapted to grip a mandrel during

its rearward axial shift with said internal member, and means for ejecting the mandril subsequent to the breaking thereof, the improvement which includes:

clutch means associating the drive shaft with the axially shifting internal member;

latching means adapted to engage said clutch means whenever the drive shaft is axially shifted forwardly from a rest position by a manual push;

unlatching means adapted to disengage said clutch means and to return the drive shaft rearwardly to its rest position, said unlatching means being responsive to the rearward axial movement of means moving with the chuck near the end of the rearward movement portion of the cycle of operation, and;

said clutch means, latching means, and unlatching means including a tubular collar of the drive shaft adapted to latch the clutch means when shifted in a forward position to compress split-nut means into engagement with an axially shiftable screw at its rest position, said screw disengaging the clutch by shifting the axially shiftable collar for a predetermined distance to its rest position, there being a spring adapted to urge the screw to its rest position upon the disengagement of the clutch, and there being a pair of springs to expand the split-nut to its rest position upon the disengagement of the clutch.

3,906,776

SELF-DRILLING BLIND RIVETING TOOL

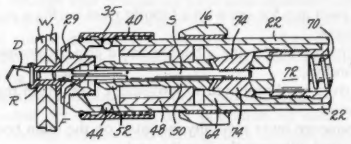
Alan K. Humphreys, Walsall; Daniel R. Smith, and Edward H. Webb, both of Sutton Coldfield, all of England, assignors to USM Corporation, Boston, Mass.

Filed Nov. 11, 1974, Ser. No. 522,887

Claims priority, application United Kingdom, Dec. 8, 1973, 56986/73

Int. Cl.² B21D *9/05, 31/00*

U.S. Cl. 72—391 **13 Claims**



1. A blind-riveting tool for setting the rivets of self-drilling pull-type blind-riveting assemblies having a mandrel stem in a workpiece, comprising a housing portion, a sleeve rotatably mounted in the housing portion and projecting forwardly therefrom to provide abutment means to engage the head of the rivet and restrain bodily movement thereof relative to the workpiece during rivet setting, and mandrel-pulling means mounted in said sleeve for rotation therewith and for axial reciprocation relative thereto, the mandrel-pulling means being engageable with the mandrel stem to cause rotation of the assembly for the drilling operation and thereafter operable to grip and pull the mandrel to set the rivet, and the tool comprising power means whereby, in the operation of the tool, said sleeve and mandrel-pulling means are rotated to enable the assembly to drill a hole in the workpiece and means whereby the mandrel-pulling means is thereupon retractable relative to said sleeve to set the rivet.

3,906,777

JACK FOR REPAIRING CAR BODY PARTS

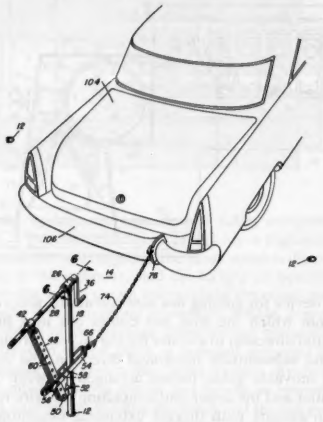
Buford T. Dickens, Box 676, Belair Rd., Rt. 4, Martinez, Ga. 30907

Filed Aug. 1, 1973, Ser. No. 384,495

Int. Cl.² B21D *1/12*

U.S. Cl. 72—447 **11 Claims**

1. A car body repair jack (**10**) comprising a stanchion (**18**), an angular arm (**48**), means (**50**) pivoting said angular arm at one end thereof to a clamp (**52**) secured on said stanchion (**18**) adjacent one end of said stanchion, a pressure applying means (**28**), a means (**42**) pivotally securing on end of said pressure tension means (**28**) to the other end of said angular arm (**48**), means (**26**) pivotally securing the other end of said pressure tension means (**28**) to said stanchion (**48**) adjacent the other end of said stanchion, means (**36,108**) for actuating said pressure tension applying means (**28**), a car body repair tool (**66,70**), and a tool mounting bracket (**54**) pivoted (**56**) to said angular arm (**48**) in combination with means (**12**) for selectively mounting said stanchion against horizontal movement in any one of several different locations for operation of said jack (**10**) on differently located car body parts without relocating the car (**104**) whose parts are being repaired com-



prising a plurality of stanchion receiving and supporting sockets (**12**) countersunk in a pavement (**14**) surrounding a car locating area on said pavement, said pressure tension applying means comprising a screw (**28**), said means (**42**) pivotally securing one end of said pressure tension means (**28**) to the other end of said angular arm (**48**) comprising a nut (**42**) through which said screw (**28**) is threaded, said actuating means (**26,108**) for said pressure tension means (**28**) including controllable means (**36,108**) for rotating said screw (**28**) through said nut (**42**), said means (**26**) pivotally securing the other end of said pressure tension means (**28**) to said stanchion (**18**) adjacent the other end of said pressure tension means comprising a shaft bearing (**26**) through which said screw (**28**) is journaled.

3,906,778

PIPE AND TUBE BENDER

Ralph B. Crouse, 10-B Mary St., N. Braddock Hgts., North Braddock, Pa. 15104

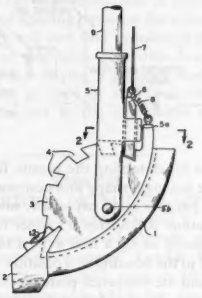
Filed May 10, 1974, Ser. No. 468,770

Int. Cl.² B21D *7/03*

U.S. Cl. 72—459 **1 Claim**

1. A pipe and tube bender comprising a body portion having an integral groove formed along one arcuate edge for engaging a peripheral portion of the pipe or tube to be bent and having a closed loop integral flange at one end thereof for closely embracing an opposite peripheral portion and having an integral projection at the other end thereof, said body portion also having a plurality of peripherally spaced notches along an opposite arcuate edge, a socket for a handle having a saddle end portion straddling both sides of said body portion and terminating in an end pivotally connected to said body portion, a handle attached to the open end of said socket, an integrally secured open loop portion extending laterally thereof, a dog slidably mounted in said open loop portion in the same plane as the bottom portion of said groove, spring

means normally biasing said dog into one of said notches, means for overcoming the tension of said spring means for withdrawing said dog from said notch and enabling pivotal movement of said dog into alignment with another selected notch at which position said spring means will bias said dog into the newly selected notch for changing the angularity of



the lever relative to the pipe that is being bent, said spring means being in the form of a coil spring having one end attached to the extremity of said dog and the other end attached to said projection of said body portion, and a cord also attached to said extremity of the dog for pulling and withdrawing said dog from one of said notches against the action of said coil spring.

3,906,779

SHOCK-ABSORBER TEST METHOD AND APPARATUS

Robert Peter Samuel Graham, and Edward Knut Patrick Graham, both of Norr Malarstrand 34, 112 20 Stockholm, Sweden

Filed Jan. 14, 1974, Ser. No. 433,097

Claims priority, application Sweden, Jan. 17, 1973, 73006231

Int. Cl.[2] G01M *17/04*

U.S. Cl. 73—11 9 Claims

3. An apparatus for testing the operational capacity of shock-absorbers mounted on a vehicle and attached to the vehicle wheels including in combination, a recording device having a weighing means, and a lifting device having a carrying means for lifting one of the vehicle wheels to a definite height above the weighing means and releasing the wheel so as to cause the wheel to fall freely down onto the weighing means, said recorder means being operative to form a curve of the weighing means oscillations in response to impact and oscillation of the wheel thereon.

3,906,780

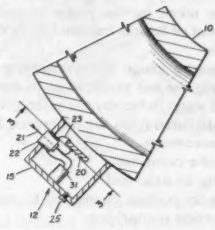
PARTICULATE MATERIAL DETECTION MEANS

Willett F. Baldwin, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 297,175, Oct. 12, 1972, Pat. No. 3,841,144. This application Dec. 7, 1973, Ser. No. 422,618

Int. Cl.[2] G01N *15/06*

U.S. Cl. 73—61 R 10 Claims



1. A means for detecting particulate material in a fluid stream which is flowing through a conduit comprising:

a housing adapted to be positioned against the outside of said conduit;

a transducer means responsive to acoustic energy to generate a signal representative of said energy;

means for freely suspending said transducer means within said housing so that said transducer means does not contact said housing or said conduit when in an operable position and is free for relatively undampened vibration when excited by particulate material striking the inside of the conduit;

means in said housing for allowing said housing to be filled with a noncompressible liquid; and

output means for providing an output for said signal generated by said transducer means.

3,906,781

SOIL PROBES FOR MEASURING VARIOUS SOIL PARAMETERS

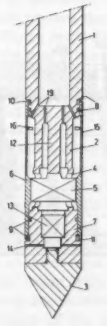
Adriaan Vlasblom, Den Hoorn, Netherlands, assignor to Stichting Waterbouwkiendig Laboratorium, Delft, Netherlands

Filed Feb. 4, 1974, Ser. No. 439,606

Claims priority, application Netherlands, Feb. 9, 1973, 7301924

Int. Cl.[2] G01N *3/00*

U.S. Cl. 73—84 6 Claims



1. A soil probe comprising

a tube arranged to be pressed axially into the soil, and having an axis, the length of said tube being extendable by means of extension tubes,

an annular elastically deformable wall portion having an inner surface, the wall portion being arranged substantially coaxially with the tube and being connected thereto,

strain gauges mounted on the inner surface of the wall portion to effect pressure measurement of soil pressure acting transversely to the tube axis, the gauges being arranged substantially in a plane perpendicular to the tube axis thereby rendering transverse soil pressure measurements taken as the probe is pressed into the soil independent of lateral friction forces experienced by the probe, and

a water pressure gauge communicating with the medium surrounding the soil probe so as to measure the pressure of ground water, whereby the inter-granular soil pressure can be calculated from the difference between said pressure measurements.

2. A soil probe comprising

a tube having an axis, and

a soil probe tip portion connected to one end of the tube, the tip portion comprising

a probe tip,

a structure connecting the probe tip to the said tube,

a measuring sleeve having an outer diameter which is substantially equal to that of the tube, the sleeve sealingly surrounding the said structure and being movable in the axial direction of the tube, a part of said measuring sleeve forming an annular elastically deformable wall portion,

at least one strain gauge mounted on the said wall portion so as to measure deformation of the wall portion in a direction transverse to the axis of the tube caused by soil pressure acting in that direction,

an internal measuring body connected to the said structure and to the sleeve,

strain gauges mounted on the internal measuring body to enable lateral friction forces of the soil to be determined, and

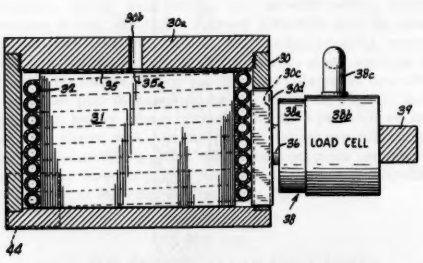
a water pressure gauge mounted on the structure, and in communication with the exterior of the soil probe for measuring the pressure of surrounding water.

3,906,782

ISOSTATIC CRUSH STRENGTH TEST SYSTEM

Jack J. Early, Perth Amboy, N.J., and Alfred Stawsky, Bronx, N.Y., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Feb. 4, 1974, Ser. No. 439,566
Int. Cl.[2] G01N *3/10*
U.S. Cl. 73—94 **17 Claims**



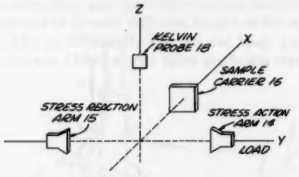
4. An isostatic test system in accordance with claim **1** wherein said pressure-expansible fluid impermeable tubing upon insertion within said rigid container and upon being pressurized by said pressurized fluid is in direct contact with said material for isostatic testing therein.

3,906,783

INSTRUMENT FOR DETECTING THE PLASTIC FLOW POINT OF A METAL

John C. Schumacher, San Mateo, Calif., assignor to J. C. Schumacher Co., Oceanside, Calif.

Filed June 3, 1974, Ser. No. 475,799
Int. Cl.[2] G01N *3/08*
U.S. Cl. 73—94 **7 Claims**



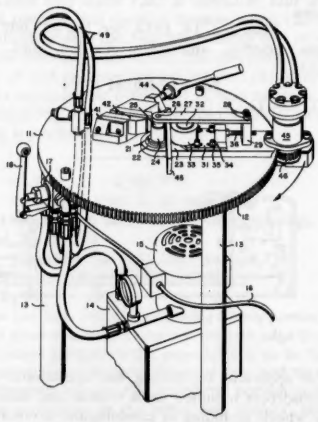
1. Apparatus for detecting the plastic flow point of a sample, the sample having a shape and composition to function as one plate of a parallel plate capacitor, said apparatus including in combination: a housing; a carrier for the sample movable in the housing along a first axis; a reference plate electrode mounted in the housing in a position at which the sample in the carrier and the reference plate electrode form a parallel plate capacitor; a stress mechanism movable in the housing along a second axis traversing said first axis to exert a stress on the sample in the sample carrier; and an external circuit connected to the parallel plate capacitor formed by the sample and the reference plate electrode to provide electrical voltage indications as the stress in the sample is increased and to detect the point of reversal of current flow through the parallel plate capacitor.

3,906,784

BEND TEST MACHINE FOR WELD COUPON SAMPLES

Robert N. Coulstring, Hanover, Mass., assignor to Triangle Engineering, Inc., Hanover, Mass.

Filed Aug. 14, 1974, Ser. No. 497,260
Int. Cl.[2] G01N *3/20*
U.S. Cl. 73—100 **5 Claims**



1. A guided bend test machine for a weld coupon sample or the like comprising:

a table gear in the form of a flat plate supported on a depending support means, said flat plate having a periphery at least a portion of which is a circular edge with gear teeth therein;

a pivot bearing on said plate concentric with said circular edge;
a lever arm rotatable around said pivot bearing on said table gear and extending beyond said circular edge;
a pinion gear extending from said lever arm in driving engagement with said gear teeth on said circular edge;
a drive motor mounted on said lever arm and connected to drive said pinion gear;
a cylindrical die supported concentric with said circular edge and projecting above said lever arm;
a pressure roll rotatably mounted on said lever arm on an axis parallel to the axis of rotation of said lever arm with a predetermined spacing between the cylindrical surfaces of said pressure roll and said cylindrical die; and
a vise mounted on said table gear with fixed and movable jaws, the fixed jaw having a gripping surface located to hold a flat plate gripped by said jaws with one surface substantially tangent to the cylindrical surface of said cylindrical die.

3,906,785

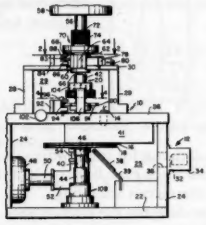
ANGULAR MOTION DETECTION APPARATUS

Dewie E. Black, Dearborn Heights; Donald F. Fabry, Garden City, and Thaddeus Dombrowski, Detroit, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 176,844, Sept. 1, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 396,783

Int. Cl.² G01M *13/02*

U.S. Cl. 73—118 **15 Claims**



1. In an apparatus for testing operability of a rotary clutch having a rotary input mechanism and a rotary control mechanism including a plurality of stop positions and a rotary output mechanism, said apparatus having means for rotating said rotary input mechanism, the improvement comprising:
means for intermitting rotation of said control mechanism at said plurality of stop positions for halting rotation of said rotary output mechanism; and
means for automatically sequencing said intermitting means according to a predetermined order of said stop positions; and
means for detecting angular motion of said rotary output mechanism after said intermitting of said control mechanism rotation.

3,906,786

OVERLOAD PROTECTOR FOR TORQUEMETER

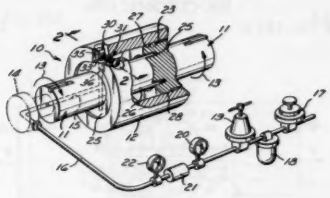
Carl M. Westbrook, Beloit, Wis., assignor to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 15, 1974, Ser. No. 460,799

Int. Cl.² G01L *3/04*

U.S. Cl. 73—136 A **3 Claims**

1. A torque sensing instrument comprising a torsion shaft, a fluid flow unit having a nozzle member adapted to conduct fluid, an anvil member spaced a predetermined distance from and facing said nozzle member for impeding flow therefrom or thereto, mounting means for supporting the members on the shaft with the nozzle member being supported from one location on the shaft and the anvil member being supported from another location axially spaced from said one location so that relative rotational movement occurs with torsion in the shaft, means for continuously moving fluid under constant pressure through the nozzle member, and pressure-responsive means indicating variations in pressure occurring at the nozzle member caused by changes in distance between the nozzle member



and said anvil member as said members are moved through said predetermined distance by shaft rotation, at least one of said members including displaceable means permitting overload movement of the members toward each other beyond said predetermined distance to prevent deformation of surrounding structure, said displaceable means comprising a thinned neck section of one of said members.

3,906,787

TORQUE-MEASURING COUPLING

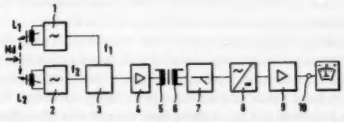
Berthold Wingbermuhle, Bad Homburg, Germany, assignor to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft, Bad Homburg, Germany

Filed Apr. 15, 1974, Ser. No. 460,989

Claims priority, application Germany, Apr. 21, 1973, 2320309

Int. Cl.² G01L *3/10*

U.S. Cl. 73—136 A **4 Claims**



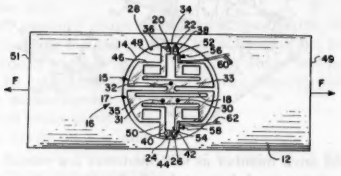
1. In combination with a shaft having an area in which torque occurs, two flanges (12, 17) secured on the shaft on opposite sides of the area, each flange having two parts located on opposite sides of said shaft and protruding in the axial direction of the shaft toward the other flange, the two protruding parts of one flange respectively carrying first and second core halves and the two protruding parts of the other flange respectively carrying third and fourth core halves located opposite to each of the first and second core halves with air gaps therebetween, first and second coils in said air gaps, first and second oscillators of different frequencies respectively comprising said first and second coils as frequency-controlling components, whereby torque applied to said shaft causes said air gaps to vary in opposite directions, thereby changing the inductances of said coils and the frequencies of said oscillators, an electronic switch having its input connected to the first oscillator, and means operatively connecting the electronic switch to the second oscillator to open and close the switch in synchronism with the frequency of the second oscillator, a rotating measurement rotary transmitter, means connecting the output of the switch to said rotating measurement rotary transmitter, the rotating measurement rotary transmitter emitting a signal corresponding to the torque-proportional differential frequencies of the two oscillators, and means connected to the output of the rotating measurement rotary transmitter to filter out the torque-proportional differential frequency of the two oscillators.

3,906,788

SELF-SUPPORTING STRAIN TRANSDUCER

Ira S. Hoffman, Newport News, Va., assignor to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,775
Int. Cl.[2] G01L *1/04*
U.S. Cl. 73—141 A **11 Claims**



1. An apparatus for measurement of surface strain within holes comprising at least one transducer assembly comprising: two surfaces contact pins intimately contacting the inner surface of a hole, said surface contact pins defining a test section on said inner surface by their separation;

rigid support means for the first of said surface contact pins; including a retaining means for attaching said first surface contact pin to said rigid support means but permitting said first surface contact pin to protrude therefrom;

flat cantilever support means for the second of said surface contact pins, including a retaining means for attaching said second surface contact pin to said flat cantilever support but permitting said second surface contact pin to protrude therefrom;

strain sensing means attached to said flat cantilever support means by conventional means;

first spring suspension means attached to said rigid support means providing force to constantly maintain said first surface contact with said inner surface;

second spring suspension means attached to said flat cantilever support means providing force to constantly maintain said second surface contact pin in intimate contact with said inner surface; support body to which both first and second spring suspension means are attached;

installation spring means attached to said support body which when compressed decreases the diametric dimension of said transducer assembly to facilitate placement of said assembly in the hole, said installation spring means including means for bearing against the inner surface of said hole diametrically opposite from said test section defined by said surface contact pins; and

compression means for compressing said installation spring means.

3,906,789

MOBILE APPARATUS FOR CONTINUOUSLY MEASURING THE RESISTANCE OF TRACK RAILS TO LATERAL PRESSURES

Waldemar Bingmann, Essen, Germany, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Sept. 16, 1974, Ser. No. 506,750
Claims priority, application Germany, Sept. 24, 1973, 2347951
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—146 **7 Claims**

1. A mobile apparatus for continuously measuring the resistance of track rails to lateral pressures tending to increase the track gage, comprising

1. a rail test car mounted for mobility on the track rails for advancing in the direction of track elongation,

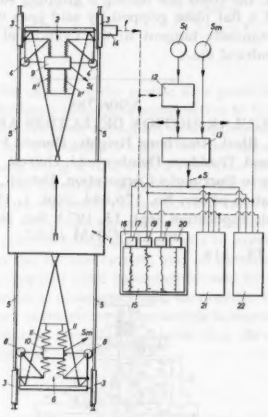
2. a leading track gage carriage coupled to the car,

3. a trailing track gage carriage coupled to the car and spaced rearwardly of the leading track gage carriage in the direction of advancement of the car along the track,

a. each track gage carriage having means for measuring the track gage and for emitting a signal indicating the measured track gage, and

b. the track gage measuring means of one of the carriages being adapted to measure the track gage with a defined lateral pressure of a magnitude different from that of the track gage measuring means of the other carriage, at least one of the defined lateral pressures being sufficient to increase the track gage,

4. a computer, and



5. an electrical circuit for transmitting the signals indicating the measured track gage from each of the carriages to the computer, the circuit including

a. means for delaying the transmission of the signal from the leading carriage for a time corresponding to the spacing between the carriages and the concomitant distance traversed during the advancement of the car and

b. means for instantaneously transmitting the signal from the trailing carriage, and

6. means in the computer for comparing the two signals and determining the increase in the track gage under a defined lateral pressure as the difference between the two signals, the determined track gage increase under the defined lateral pressure being a measure of the resistance of the track rails to lateral pressures.

3,906,790

APPARATUS FOR MEASURING FLUIDIC CURRENT

Edward C. Brainard, II, Marion, and John L. Layport, Mattapoisett, both of Mass., assignors to Environmental Devices Corporation, Marion, Mass.

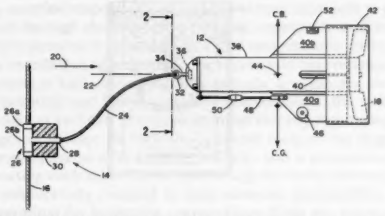
Filed Nov. 1, 1973, Ser. No. 411,646
Int. Cl.[2] G01F *15/18*
U.S. Cl. 73—170 A **13 Claims**

1. In apparatus for measuring the fluidic current in a body of water or like liquid environment and having a sensing unit for sensing the velocity and the direction of environmental fluidic current directed along a longitudinal axis of said unit, and which has a frontal suspension point and a finned configuration for the suspended alignment of said longitudinal axis thereof with the environmental current, the improvement comprising

A. ballast means affixed to said sensing unit and providing said sensing unit with a net non-negative and near neutral

buoyancy when in such liquid body and providing said sensing unit, when disposed with said longitudinal axis horizontal, with a center of buoyancy above and oppositely aligned with the center of gravity thereof, and

B. deployment means connected along said longitudinal axis to said sensing unit at said suspension point, said deployment means allowing rotation of said sensing unit about a vertically extending axis and about said longitudinal axis and including tether means for exerting pull on said sensing unit along said longitudinal axis and for substantially isolating said sensing unit from motion, directed other than along said longitudinal axis, at the end of said tether means removed therefrom.



3,906,791

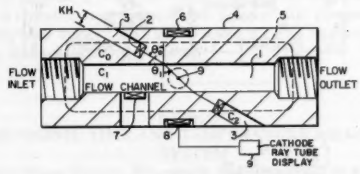
AREA AVERAGING ULTRASONIC FLOWMETERS

Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Oct. 1, 1973, Ser. No. 402,363

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **22 Claims**



1. A flowmeter cell for ultrasonically measuring the flow velocity of fluids comprising,

means for containing the flowing fluid, said means having a flow channel of rectilinear internal cross section with a width dimension W and a height dimension H, said flow channel extending in a first direction normal to the plane of said rectilinear cross section for a distance at least twice the larger one of the dimension W or H;

transducer means external to said flow channel for generating and sensing a beam of ultrasonic waves, said beam having a substantially uniform intensity rectilinear cross section with a width dimension W and height dimension kH where k * 1, said beam being transmitted into said conduit such that it is propagated through said fluid at an oblique angle with respect to said first direction.

3,906,792

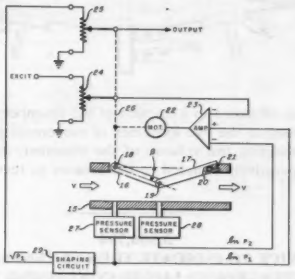
VARIABLE THROAT VENTURI AIRSPEED SENSOR

Harry Miller, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 237,425, March 23, 1972, Pat. No. 3,795,145. This application Oct. 17, 1973, Ser. No. 407,366

Int. Cl.[2] G01F *1/44*

U.S. Cl. 73—213 **13 Claims**



1. Apparatus for measuring fluid flow velocity over a wide range of velocities comprising

A. venturi defining means having inlet and outlet portions responsive to said fluid flow and having substantially equal, predetermined, fixed cross-sectional areas, and positionable means between said inlet and outlet portions for defining a throat portion of variable cross-sectional area, said positionable means including first and second inclined surfaces defining an apex and providing continuous transitions between said inlet and throat portions and said throat and outlet portions respectively,

B. means for mounting said venturi defining means on a supporting surface,

C. means for detecting fluid pressures in said throat portion and in one of said inlet and outlet portions respectively,

D. means responsive to a ratio of pressures detected in said throat portion and in said one of said inlet and outlet portions for positioning said positionable means in a sense and to an amount to provide a predetermined pressure relationship between said pressures, the position of said positionable means then obtaining corresponding to a predetermined function of said fluid flow velocity, and

E. means responsive to said positioning means and the pressure at said one of the inlet and outlet portions for providing an output signal proportional to the velocity of said fluid flow.

3,906,793

FLOW METER

Frank Wurzbacher, Hoisbuttel, Germany, assignor to The British Petroleum Company Limited, London, England

Filed Oct. 26, 1973, Ser. No. 410,162

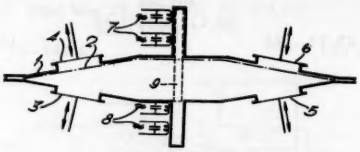
Claims priority, application Germany, Nov. 16, 1972, 2256120

Int. Cl.[2] G01F *11/08*

U.S. Cl. 73—269 **1 Claim**

1. A flowmeter comprising: a housing defining a chamber suitable for containing a liquid; a membrane displacement unit within said housing, said unit including a membrane mounted in said housing across said chamber and dividing said chamber into two sections, the membrane being adapted to conform to the internal shape of said chamber section when subject to fluid pressure; each section having a fluid inlet valve and a non-return outlet valve, the inlet and outlet valve on opposite sides of said membrane being adapted to inflate and deflate the membrane to sweep the volume of the chamber; said displacement unit further including a rod extending outwardly

on both sides of the membrane for movement in the direction of membrane movement; a plurality of impulse sensors located in staggered relationship to one another on both sides of the membrane to cooperate with said rod to produce impulses at predetermined positions of said membrane, each impulse



being thus allocated to a fraction of the chamber volume and the impulses at the two extremes of movement of the membrane indicating the volume of the chamber; and counting means operatively coupled to the sensors to record said impulses.

3,906,794

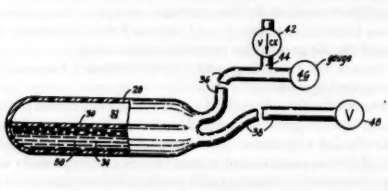
DEVICE TO INDICATE THE CONTENTS IN AN UNDERGROUND LIQUID CONTAINING TANK

Albert Shotmeyer, c/o Shotmeyer Oil & Chemical Co., One Valley St., Hawthorne, N.J. 07506

Filed Sept. 12, 1973, Ser. No. 396,577The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.

Int. Cl.[2] G01F *23/16*

U.S. Cl. 73—300 **7 Claims**



1. A device adapted to be immersed within an underground liquid containing tank to indicate the liquid contents therein comprising: a container structurally independent of the walls of the tank in which it is adapted to be immersed, the walls of the container being flexible and impervious to the passage of fluids; a flexible and impervious partition dividing said container into a first imperforated chamber and a second imperforated chamber; a first tubular conduit, one end of said first tubular conduit being connected with said first chamber; pressure responsive indicating means connected with the other end of said first tubular conduit, said first tubular conduit and said first chamber containing a hydrostatic fluid; and a second tubular conduit, one end of said second tubular conduit connected with said second chamber; both of said chambers, except for said connections with said tubular conduits, being airtight and watertight as to the liquid in which the container may be immersed.

3,906,795

GRAVITY CELL FOR LIQUID LEVEL MONITORING

Eugene Kask, Willimantic, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Mar. 20, 1974, Ser. No. 452,716

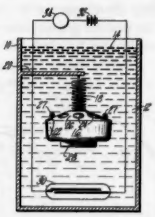
Int. Cl.[2] G01F *23/06*

U.S. Cl. 73—309 **7 Claims**

1. A liquid level monitoring device for determining a liquid level state in a container, the device including:

a shell for insertion in the liquid whose level is to be monitored;

a hollow interior chamber in said shell, said hollow interior chamber being in fluid communication with the liquid in the container whereby said hollow interior chamber contains some of said liquid at all times during liquid level monitoring, which contained liquid provides an actuating force for the liquid level monitoring device;



an end cap on said shell, said end cap having opening means to provide said fluid communication between said interior chamber and the liquid whose level is to be monitored;

means for determining at least one position of said shell in the container; and

means for balancing said shell, said balancing means being the sole suspension for said shell and imposing a force opposite to the actuating force of said contained liquid.

3,906,796

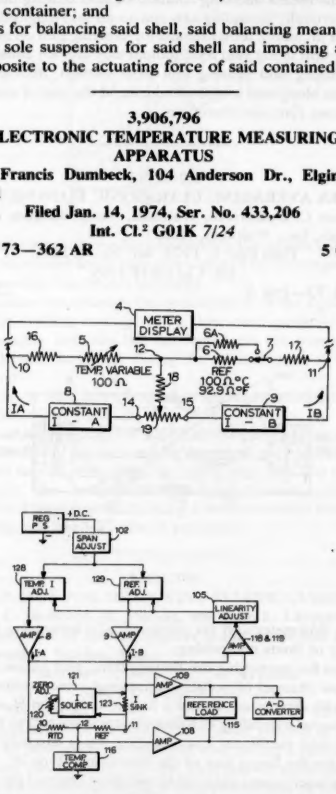
ELECTRONIC TEMPERATURE MEASURING APPARATUS

Robert Francis Dumbeck, 104 Anderson Dr., Elgin, Tex. 78621

Filed Jan. 14, 1974, Ser. No. 433,206

Int. Cl.[2] G01K *7/24*

U.S. Cl. 73—362 AR **5 Claims**



1. Apparatus for producing a direct readout of temperature in degrees on a linear scale of a voltmeter from the change of resistance of a single temperature variable resistor comprising in combination, a temperature responsive circuit coupled between a pair of temperature measurement output terminals

to develop a voltage thereat changing in a substantially linear relationship corresponding in degrees of temperature to said linear scale said circuit including said temperature variable resistor and a reference resistor of fixed resistance, both being conductively connected together at a common intermediate access terminal, said pair of temperature measurement output terminals conductively connected to the respective opposite ends of said two resistors, means developing a voltage at said terminals varying in response to temperature as a function of resistance change in said temperature variable resistor consisting of a pair of current sources each having a like pole conductively coupled respectively to said two output terminals to pass current through the respective two said resistors to said intermediate terminal to establish at a null temperature setting of 0° a cancellation of voltage drops across said two resistors as measured at said pair of output terminals, a voltmeter circuit incorporating said linear scale and responding to the voltage produced at said pair of output terminal thereby registering by changes of voltage an indication on said scale of the degrees of temperature at said variable resistor, and a potentiometer connecting each said current source together with the variable arm conductively coupled to said common intermediate access terminal for balancing current flows from the respective current sources at 0° to produce a null reading on said voltmeter scale.

5. Apparatus for producing a readout of temperature from the change of resistance of a single temperature variable resistor comprising in combination, a circuit coupled between a pair of temperature measurement output terminals including said temperature variable resistor and a reference resistor of fixed resistance both being connected together at a common intermediate access terminal and a pair of temperature measurement output terminals connected to the respective opposite ends of said two resistors, means developing a voltage at said terminals varying in response to temperature consisting of a pair of current sources each having a like pole coupled respectively to said two output terminals to pass current through the respective said resistors to said intermediate terminal to establish at a null temperature setting such as 0°C a cancellation of voltage drops across said two resistors as measured at said pair of output terminals, and a voltmeter connected to said pair of output terminals thereby registering by changes of voltage an indication of the temperature at said variable resistor, including a voltmeter zero set circuit coupled between said voltmeter and one of said terminals comprising a sink resistor, a two pole variably adjustable current source, and a circuit connecting said two poles of said current source to opposite ends of said sink resistor thereby to pass current only through said sink resistor.

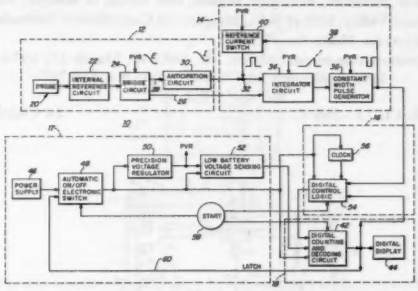
3,906,797

ELECTRONIC TIME AND TEMPERATURE MEASURING SYSTEM

Robert Bruce Turner, Weymouth, Mass., assignor to American Medical Electronics Corporation, Weymouth, Mass.

Filed May 28, 1974, Ser. No. 473,492
Int. Cl.² G01K 7/24
U.S. Cl. 73—362 AR **6 Claims**

1. An electronic thermometer system having an operation interval including a temperature mode period during which a measured temperature is displayed and a time mode period during which a measured length of time is displayed, comprising: a temperature sensing circuit for providing an analog signal representative of variations in temperature; a temperature measuring circuit, responsive to said analog signal representative of variations in temperature provided by said temperature sensing circuit, for providing a digital signal representative of the temperature sensed; a timing and control circuit, responsive to said digital signal representative of the temperature sensed provided by said temperature measuring circuit, and defining an operation interval including a temperature mode period and a time mode period, for generating a signal representative of a predetermined length of time during said time mode period and for selectively presenting its output, said signal representative of said predetermined length of time during said time mode period and said digital signal representative of the temperature sensed during said temperature mode period; and a display circuit responsive to said



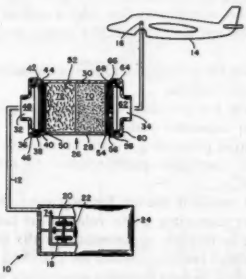
output from said timing and control circuit for selectively displaying, during said temperature mode period, the measured temperature indicated by said digital signal representative of the temperature sensed and displaying, during said time mode period, the measured time indicated by said signal representative of said predetermined length of time.

3,906,798

INSTRUMENT PROTECTING MEANS

Walter L. Dray, Davenport, Iowa, assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 30, 1974, Ser. No. 510,838
Int. Cl.² G01L 7/20
U.S. Cl. 73—384 **8 Claims**



1. A protector means for preventing moisture present in the air from entering a sealed housing and affecting the operation of an instrument located in the housing and which is responsive to altitude changes of the sealed housing, said protector means comprising:

a container having a chamber therein, said chamber having a first port and a second port;

first conduit means connecting the first port with the sealed housing;

second conduit means connecting the second port with the atmosphere; and

filter means substantially filling said chamber for adsorbing oxygen and water vapor from said air when there is a decrease in the altitude of said housing whereby dry nitrogen enriched effluent flows into the sealed housing, and said dry nitrogen enriched effluent flows from the housing through the first conduit means into the chamber thereby purging the filter means of oxygen and water

vapor when there is an increase in altitude of said housing to regenerate the filter.

3,906,799

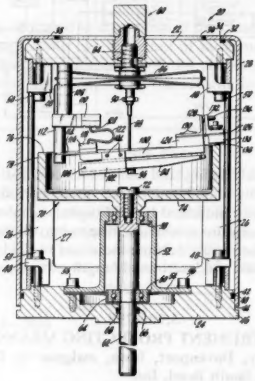
PRESSURE RESPONSIVE MEASURING INSTRUMENTS

Irwin Wallman, Briarcliff Manor, and Erwin S. Rodger, Locust Valley, both of N.Y., assignors to Consolidated Airborne Systems, Holtsville, N.Y.

Continuation-in-part of Ser. No. 449,848, March 11, 1974. This application Jan. 6, 1975, Ser. No. 538,767

Int. Cl.[2] G01L 9/12

U.S. Cl. 73—398 C 14 Claims



1. A pressure responsive instrument comprising:

a. a fluid-tight housing;

b. an extendable bellows contained within said housing;

c. a fitting for selectively placing the interior of said bellows in fluid communication with a source of pressure;

d. upper and lower capacitor plates mounted in said housing;

e. means for securing said lower capacitor plate to one end of said bellows;

f. means for coupling said upper capacitor plate to said lower capacitor plate;

g. function generating means for moving the position of said upper capacitor plate relative to said lower capacitor plate;

h. first resilient means for adjusting the position of said upper capacitor plate relative to said lower capacitor plate to thereby compensate for the effects of hysteresis;

i. second resilient means for coupling said upper capacitor plate to said function generating means; and

j. means for driving said function generating means.

3,906,800

REUSABLE NIP MEASURING DEVICE AND METHOD

Reghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 19, 1974, Ser. No. 498,491

Int. Cl.[2] G01L 5/00

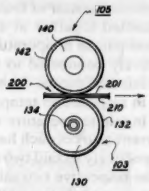
U.S. Cl. 73—432 R 3 Claims

1. A device for measuring heat and pressure of a fusing nip between heat and pressure fusing rolls comprising:

a first sheet of polyimide film material having a thickness ranging from about .003 to about .008 inches, said first sheet being transparent,

a second sheet of polyimide film material positioned in overlying relationship with said first sheet, said second sheet having a coating of silicone rubber material of a thickness ranging from about .002 to about .004 inches, and

nip means for applying pressure to said sheets for a predetermined time whereby upon separation of the sheets



from said nip means is formed on said first sheet indicating pressure and contact arc characteristics of the nip means.

3,906,801

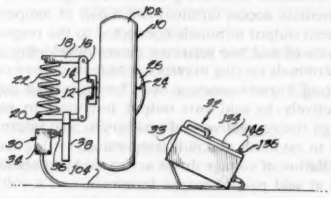
APPARATUS FOR BALANCING ROTATING BODIES

Louis L. Butler, Baton Rouge, La., assignor to Bear Manufacturing Corporation, Rock Island, Ill.

Continuation of Ser. No. 371,369, June 19, 1973, abandoned, which is a continuation of Ser. No. 234,488, March 14, 1972, abandoned. This application Mar. 29, 1974, Ser. No. 456,143

Int. Cl.[2] G01M 1/28

U.S. Cl. 73—457 6 Claims



1. Apparatus for use in balancing automotive wheels comprising a sensing unit and an indicator unit, wherein said sensing unit includes a housing, a clamp device joined to said housing for detachably mounting said sensing unit on a component of an automobile adjacent a wheel being balanced, a switch mount affixed to said housing, a pair of inertia switches carried on said mount and each including a first contact member fixed relative to said mount to move with said mount and a second contact member movable toward and away from said first contact member by virtue of the inertia of said second contact member as said sensing unit is moved in accordance with vibrational movement of such component, said switches being disposed with the paths of movement of said second contact members toward and away from the respective first contact members in orthogonal relationship to one another, an electrical generator unit in said housing including a core element and a coil element with one of said elements mounted for movement relative to the other of said elements by virtue of the inertia of said movable element as said sensing unit is moved in accordance with vibrational movement of such component, said generator unit being oriented to provide such relative movement in a direction parallel to the path of movement of one of said second contact members, and said indicator unit including a strobe light having an on-off control circuit, electrical leads extending between said inertia switches and said indicating unit, a switch on said indicating unit for selectively placing either of said inertia switches in the control circuit of said strobe light, and a meter connected with said generator for providing an indication corresponding to the output of said generator.

3,906,802
FLUID CRASH SENSOR

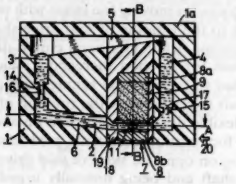
Kohhei Nonaka; Hitoshi Miura, both of Tokyo, and Masayoshi Fukushima, Sakai, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 352,744, April 19, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,340

Claims priority, application Japan, Apr. 24, 1972, 47-41627; May 29, 1972, 47-53683; Oct. 30, 1972, 47-109083

Int. Cl.[2] G01P *15/08*

U.S. Cl. 73—516 LM **25 Claims**



1. A shock sensor comprising:
a. a vessel containing a fluid passageway for receiving a conductive fluid therein;
b. a body of conductive fluid contained in said fluid passageway;
c. means in said vessel for permitting said conductive fluid to move in said fluid passageway;
d. detection means disposed within the vessel for relative movement with respect to the fluid when the vessel is subjected to a shock, said detection means comprising:
i. magnetic means for establishing a magnetic field in a direction substantially perpendicular to the direction in which the fluid moves within the fluid passageway;
ii. a pair of electrodes disposed in opposing relationship with each other within the fluid passageway and spaced apart in a direction substantially perpendicular to both the magnetic field and the direction of movement of the fluid to detect said relative movement and to produce an indicative electrical signal; and
e. threshold presetting means disposed at a point in said passageway for preventing the movement of said conductive fluid beyond said threshold presetting means in said passageway until the shock to which said vessel is subjected exceeds a given magnitude and for thereupon passing a quantity of said fluid.

3,906,803
COMBINATION MECHANICAL VIBRATOR AND STETHOSCOPE

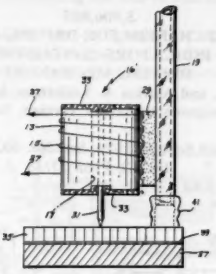
Victor E. Pike, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 9, 1974, Ser. No. 486,802

Int. Cl. G01n *29/00*

U.S. Cl. 73—552 **4 Claims**

1. An eddy sonic stethoscope for the non-destructive testing of a workpiece with a non-metallic outer surface, said eddy sonic stethoscope comprising a solenoidal coil spaced above the surface of the workpiece and including a toroidal ferrite core having an axially oriented central opening therethrough and a conductor wire wound around the outside of said core, said conductor wire being operatively connected to an eddy current excitation source, a listening tube in parallel relationship to and spaced from the outer side surface of said solenoidal coil and extending upwardly from the surface of the workpiece, means for isolating said listening tube from said solenoidal coil, a permanent magnetic rod armature disposed axially through the central opening of said solenoidal core and extending downwardly therefrom to contact the surface of the workpiece, and means for retaining said armature rod in position in the central opening in said ferrite core while allowing said armature rod to move freely along its longitudinal axis in



response to eddy currents in said solenoidal coil thereby transferring mechanical energy to the workpiece causing it to vibrate and produce sounds which can be heard through the listening tube.

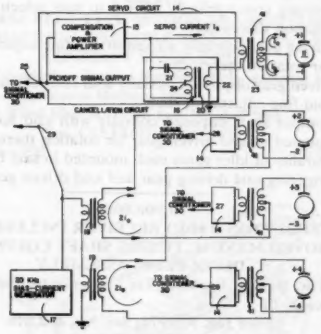
3,906,804
SPEED CONTROL FOR AN ELECTROSTATICALLY SUPPORTED BALL GYROSCOPE

James L. Atkinson, La Mirada, and Joseph C. Boltinghouse, Whittier, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 77,993, Oct. 5, 1970, abandoned. This application Dec. 20, 1973, Ser. No. 427,000

Int. Cl. G06c *19/08*

U.S. Cl. 74—5.7 **10 Claims**



1. A speed-controlling apparatus for an all-attitudes, electrostatically supported spinning ball gyro comprising:
a case;
a spinning spherical ball in said case;
a set of spherical-surface electrostatic electrodes in the case surrounding said ball and disposed to define a plurality of levitation axes in three orthogonal axes;
electrical servo means associated with the electrodes and being responsive to the approach of the ball toward and recession from the electrodes for adjusting the field between electrodes and ball in a manner to urge the ball toward center, the ball being so constructed as to have its center of mass displaced laterally from its spin axis so as to define a moment arm upon which a force radial to the ball can act; and
phase lag means interposed in said servo means at substantially the frequency of desired ball speed so as to provide an accelerating moment when the ball drops below de-

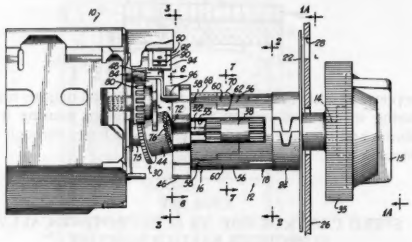
sired speed and a decelerating moment when it rises above desired speed for all attitudes of said ball with respect to said case.

3,906,805

DRIVING MECHANISM FOR DRIVING INTERNALLY MOUNTED INDICATORS CONTAINING FINE TUNE DRIVING MECHANISM

Joe G. Badger, and Alarico A. Valdettaro, both of Bloomington, Ind., assignors to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Sept. 6, 1974, Ser. No. 503,979
Int. Cl. F16h 35/18
U.S. Cl. 74—10.54 23 Claims



1. A driving mechanism for an indicator usable with a selector mechanism having a central selector shaft and a fine adjustment shaft disposed concentrically about said central selector shaft, the drive mechanism being operable to drive said indicator to indicate the position of said selector shaft independently of the position of said fine adjustment shaft, said driving mechanism comprising:

a housing concentrically affixed to said selector shaft for rotation therewith;

a driving gear coaxially affixed to said fine adjustment shaft for rotation therewith;

a driven gear disposed coaxially with said selector shaft and said fine adjustment shaft;

an output shaft disposed coaxialy with said selector shaft coupled to said driven gear for rotation therewith; and

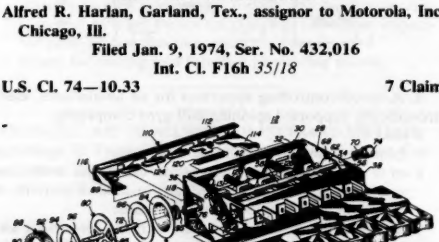
a plurality of idler gears each mounted in said housing and engaging said driving gear and said driven gear.

3,906,806

PUSHBUTTON RADIO RECEIVER INCLUDING AN IMPROVED MANUAL TUNING SHAFT COUPLING AND DECOUPLING ASSEMBLY

Alfred R. Harlan, Garland, Tex., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 9, 1974, Ser. No. 432,016
Int. Cl. F16h 35/18
U.S. Cl. 74—10.33 7 Claims



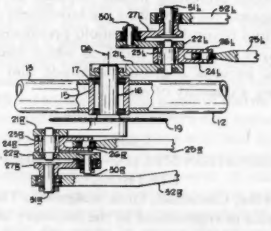
1. A pushbutton radio receiver including a tuner portion having a plurality of stationary tuning coils mounted therein, a plurality of tuning cores mounted for movement with respect to said coils for changing the frequency received by said radio receiver, a plurality of pushbuttons mounted in said tuner portion and being manually depressible, means coupling said pushbuttons and said cores for movement of the latter to predetermined positions with respect to said coils in response to the depression of said pushbuttons, manual tuning means including a rotatable tuning shaft for moving said cores with respect to said coils to alter the frequency received by said radio receiver in response to the rotation of said manual tuning shaft, a drive shaft mounted for rotation in said tuner portion, coupling means for coupling said manual tuning shaft and drive shaft, said drive shaft being rotatable thereby in response to the rotation of said manual tuning shaft and being coupled to said cores for moving the latter with respect to said coils in response to the rotation of said drive shaft, said coupling means including first and second clutch discs mounted on said drive shaft for rotation thereabout, said first clutch disc being coupled to said manual tuning shaft and rotatable on said drive shaft in response to the rotation of said manual tuning shaft, a flexible drive disc mounted on and attached to said drive shaft for rotation therewith, said first and second clutch discs being on opposite sides of said drive disc on said rotatable drive shaft and being normally urged into driving engagement therewith for imparting rotational force thereto in response to the rotation of said manual tuning shaft for altering the frequency received by said radio receiver and declutch means movable between a first and second position by the depression of one of said pushbuttons, said declutch means being coupled to said shaft coupling means and disengaging said clutch discs with respect to said flexible drive disc in response to the depression of said pushbutton to decouple said manual tuning shaft while said pushbutton is depressed.

3,906,807

BICYCLE DRIVE ASSEMBLY

Earl M. Trammell, Jr., St. Louis, Mo., assignor to Cycle-Drive Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 229,898, Feb. 28, 1972, Pat. No. 3,779,099. This application Nov. 19, 1973, Ser. No. 417,060
Int. Cl. F16h 21/14
U.S. Cl. 74—143 11 Claims



1. A drive assembly for a physically-propelled vehicle comprising:

a. a drive member rotatively mounted on a drive axis,

b. a crank arm operatively connected to the drive member for rotating the drive member,

c. an advance-crank arm connected to the crank arm,

d. connector means pivotally connected to the advance-crank arm by a first pivot means spaced from the connection of the advance-crank arm to the crank arm,

e. pedal and guide means operatively connected to the connector means for moving the connector means in a predetermined path,

f. control means pivotally connecting the connector means to the crank arm for shifting pedal force from the crank arm to the advance-crank arm, and for later shifting the pedal force back to the crank arm upon rotation of the crank arm,

g. clutch means connecting the advance-crank arm to the crank arm for relative pivotal movement in only one direction, and

h. the control means including a pivot means between the crank arm and connector means and movable forwardly relative to the crank arm in the direction of crank arm travel at a predetermined angular position of the crank arm to shift the pedal force from the crank arm to the advance-crank arm.

3,906,808

CONTROLLABLE AGGREGATE-DRIVE FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY FOR MOTOR VEHICLE INTERNAL COMBUSTION ENGINES

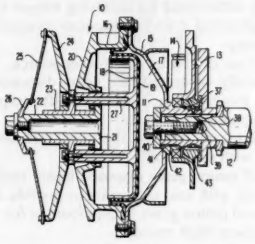
Wolfgang Zaiser, Althutte, and Sigurd Hainmuller, Aichschiess, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 11, 1973, Ser. No. 423,788

Claims priority, application Germany, Dec. 13, 1972, 2260797

Int. Cl.² F16H *55/52*

U.S. Cl. 74—230.17 F **19 Claims**



1. A controllable aggregate-drive for internal combustion engines which includes an adjustable V-belt transmission means adapted to be operatively connected with a crankshaft of the engine and operable to provide a transmission ratio with a speed increase at low rotational speeds of the internal combustion engine and a transmission ratio with a speed reduction at high rotational speeds of the internal combustion engine, said V-belt transmission means including a drive pulley means adjustable with the aid of an adjusting piston means actuated by pressure oil against a spring force, characterized by cylinder space means forming a pressure space means and receiving the adjusting piston means, the pressure space means is filled with oil having a predetermined substantially constant base pressure from the lubricating oil circulation of the internal combustion engine by way of a control valve means and in that above the base pressure the adjusting piston means is acted upon by the centrifugal force of the oil-filling within said pressure space means.

3,906,809

TRANSMISSION HAVING AN INFINITELY VARIABLE DRIVE RATIO

Marlo W. V. Erickson, 2703 E. Copper, Apt. C, Tucson, Ariz. 85716

Filed Mar. 11, 1974, Ser. No. 449,740

Int. Cl.² F16H *09/00, 15/16*

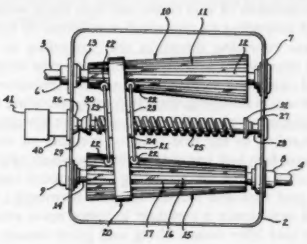
U.S. Cl. 74—217 S **7 Claims**

1. A variable gear ratio transmission for transmitting torque and having an input shaft and an output shaft; said transmission comprising in combination:

a. a first tapered gear connected to the input shaft, said first gear having a plurality of constant width longitudinally oriented splines;

b. a second tapered gear connected to the output shaft, said second gear having a plurality of constant width longitudinally oriented splines, said second gear being mounted with its axis parallel to and in alignment with the axis of said first gear, said first and second gears having the adjacent portions of their surfaces parallel to one another in the plane containing the axis of said first and second gears;

c. a drive chain interconnecting said first and second gears, said drive chain including a plurality of pivotal chain links to accommodate the varying circumference of said first and second gears;



d. gripping means disposed within said drive chain for gripping said splines of said first and second gears, said gripping means alternately engaging and disengaging said splines of said first and second gears as said drive chain travels about said first and second gears; and

e. guide means for positioning said drive chain along the axis of said first and second gears; whereby, said gripping means positively engages said splines of said first and second gears to establish a gear ratio commensurate with the position of said guide means.

3,906,810

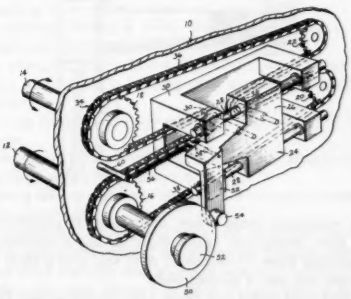
ENDLESS BELT TYPE MOTION TRANSMITTING DEVICE HAVING A VARIABLE SPEED OUTPUT FOR A CONSTANT SPEED INPUT

Major D. Glendening, Benton Harbor, Mich., assignor to F. P. Rosback Co., Benton Harbor, Mich.

Filed Mar. 4, 1974, Ser. No. 447,980

Int. Cl.² F16H *35/06, 9/00*

U.S. Cl. 74—395 **6 Claims**



1. A motion transmitting device comprising two pairs of spaced first and second rotative members, said first and second rotative members having substantially parallel axes of rotation, the first rotative members of said paris having their axes of rotation lying in a plane extending therebetween, the second rotative members of said pairs having their axes of rotation lying in a plane extending therebetween and being spacedly positioned from the plane extending between the axes of rotation of said first rotative members, idler means

positioned between said pairs and said planes and including a third pair of rotative members, said third pair of rotative members having axes of rotation paralleling the axes of rotation of said first and second rotative members, guide means wherein said third pair of rotative members is reciprocally shiftable as unit along a substantially straight line between said planes from adjacent one said first mentioned pairs to adjacent the other of said first mentioned pairs, an endless flexible drive member trained about each of said rotative members in a power transmitting relationship, said drive member extending from the first rotative member of said one pair to the first rotative member of said other pair and there reversing direction and extending to one rotative member of said third pair and again reversing direction and extending to the second rotative member of said other pair and again reversing direction and extending to the second rotative member of said one pair and again reversing direction and extending to the other rotative member of the third pair and there reversing direction and extending to the first rotative member of said one pair, one of said first and second rotative members of said one pair constituting means for receiving a rotational input whereby one of said first and second rotative members of said other pair will experience a variation in speed upon selected movement of said idler means along said guide means, and means for continuously shifting said idler means along said guide means in reciprocative directions and at repetitive variable speeds.

3,906,811

VELOCIPEDE TREAD CRANK

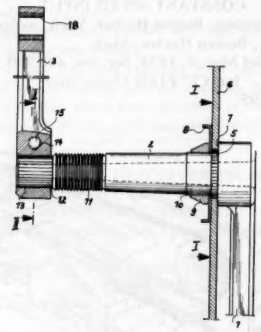
Alfred Thun, Neuenloher Weg 14, D-5828 Ennepetal-Voerde, Germany

Filed Apr. 29, 1974, Ser. No. 465,363

Claims priority, application Germany, Nov. 9, 1973, 2359437

Int. Cl.[2] B62M *3/00*

U.S. Cl. 74—594.1 **5 Claims**



1. A velocipede tread crank, comprising in combination:

a. a light metal cast crank shaft having a smallest outer diameter from 20 mm to 25 mm; said crank shaft having a first end and a second end;

b. a first light metal cast crank arm carried at said first end of said crank shaft and forming therewith an integral, one-piece component;

c. a second light metal cast crank arm having an end portion including means defining a bore, said second end of said crank shaft being received in said bore, said bore and said second end of said crank shaft forming connecting means for releasably attaching said second crank arm to said crank shaft remote from said first crank arm; and

d. tightening means forming part of said connecting means for clamping said second crank arm to said crank shaft.

3,906,812

LOCKING DIFFERENTIAL

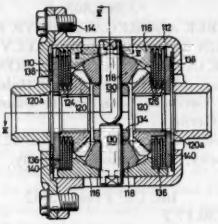
Tooru Kagata, Toyoto, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Toyoto, Japan

Filed Mar. 14, 1974, Ser. No. 451,211

Claims priority, application Japan, Mar. 31, 1973, 48-36873; Mar. 31, 1973, 48-36874; Oct. 12, 1973, 48-114987

Int. Cl.[2] F16H *1/44*

U.S. Cl. 74—711 **13 Claims**



1. A locking differential for receiving torque from a power source and delivering it to two separate coaxial output axle shafts comprising:

a rotatable case driven by said power source;

a pair of axially separated side gears disposed inside said case and mounted on said axle shafts respectively, for drive connection therewith;

pinion shaft means disposed between said side gears and rotatable with said case;

a plurality of pinion gears disposed inside said case and in engagement with said side gears to provide a differential gearing, said pinion gears being mounted for free rotation on said pinion shaft means;

a pair of axially separated collar means respectively disposed outside said pinion gears and being axially movable with respect to said axle shafts, each of said collar means being rotatably engageable with said pinion shaft means;

a pair of clutch means disposed in said case, each of said clutch means comprising at least one first clutch plate operatively and directly connected with each of said side gears and at least one second clutch plate operatively and directly connected with each of said collar means and movable therewith, thereby to create a locking function by a frictional resistance force produced upon relative rotation of said side gears;

a pair of biasing means respectively disposed inside said case for compressing said clutch means to increase the frictional resistance force; and

a pair of release means respectively interposed between said biasing means and said clutch means and being biased toward said case by said side gear to release said clutch means when thrust force of said side gear is increased.

3,906,813

SHIFT CONTROL MECHANISM FOR TRANSMISSIONS

Philip S. Webber, Morton; Maurice F. Franz, East Peoria, and Kenneth R. Moline, Peoria, all of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed June 21, 1973, Ser. No. 372,331

Int. Cl.[2] B60K *20/00*

U.S. Cl. 74—473 R **4 Claims**

1. A manually operable shift control mechanism for regulating a transmission control circuit responsive to a source of fluid pressure in order to selectively establish one of a plurality of speed ratios in the transmission, comprising

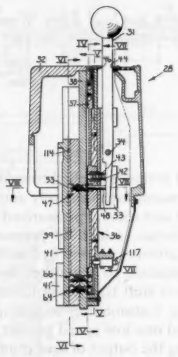
a shift control housing,

a shift control lever, means mounting said lever on said housing for angularly movement between a plurality of consecutively arranged settings respectively corresponding to the transmission speed ratios, additional means

mounting said lever on said housing for pivotable movement transversely to said angular movement,

an actuating plate being arranged for rotation with said lever,

a plurality of valve means, each including respective actuating means supported by said shift control housing, respective arcuate portions of said actuating plate including means movable during angular movement of said lever for selective interaction between one of said actuating means to operate one of said valve means, said valve means being in fluid communication with the transmission control circuit to selectively establish one of the plurality of speed ratios in the transmission,



a lock mechanism arranged for locking interaction with said actuating plate and responsive to fluid pressure in the transmission control circuit to prevent rotation of said actuating plate and lever during transient conditions within the transmission, the lock mechanism responding to operative pressurization in the control circuit for releasing said actuating plate, and a valve positioned adjacent said lever and engaged by a portion thereof when the same is pivoted in said transverse direction, said valve being in communication with said source of fluid pressure and communicating with said valve means and said lock mechanism to initiate fluid flow thereto.

3,906,814

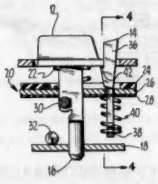
KEYBOARD KEY LOCK MECHANISM

Rolf I. Magnussen, 1954 Alvardo St., San Leandro, Calif. 94577

Filed Oct. 26, 1973, Ser. No. 409,831

Int. Cl. G05g *11/00*

U.S. Cl. 74—483 PB **4 Claims**



1. In combination with a manual keyboard key depressible perpendicularly to a keyboard mounting plate, a lock mechanism for preventing inadvertent actuation of said key, said lock mechanism comprising:

a manually actuable locking key positioned adjacent the keyboard key;

a stem section connected to said locking key and extending through an aperture in the keyboard mounting plate;

resilient means coupled to the end of said stem section opposite to said locking key for urging said stem section into a position perpendicular to said mounting plate; and

a latch on said locking key, said latch having a step surface substantially perpendicular to the longitudinal axis of said stem section and positioned to engage said keyboard key when said stem section is positioned perpendicular to said mounting plate.

3,906,815

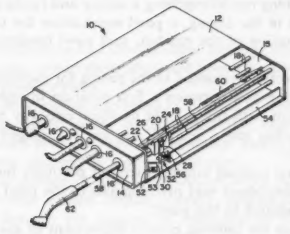
LATCHING DEVICE

Joseph Buono, 86-75 Midland Pky., Apt. 3T, Jamaica, N.Y. 11432

Filed Oct. 21, 1974, Ser. No. 516,392

Int. Cl.² G05G *5/06*

U.S. Cl. 74—527 **6 Claims**



5. A positive acting latch comprises in combination:

a. a dental unit having a front panel and a rear panel opposed thereto with said front panel being formed with at least one aperture therethrough;

b. a pair of guide members adjacent said aperture and extending between said front and rear panels;

c. a carriage having a pulley and slidable relative to said guide members for confinement thereby;

d. an elongated rail substantially parallel to said guide members and having a leading edge spaced from said front panel;

e. a stop having a control edge that faces said rail leading edge;

f. pawl means formed with notch means and attached to said carriage and pivotal thereon;

g. spring means normally biasing said carriage towards the rear panel; and

h. a dental line having two ends one of which enters said unit and wraps around the pulley so that the other line end exits through said aperture whereby pulling on said other line end allows a portion of said line to exit said aperture as said pawl means and carriage slides relative to said guide rail and past said leading edge until said notch means thereof strikes said control edge a first time to limit movement of said line, then momentarily releasing said line allows said carriage to move back towards, and strike, said leading edge locking said pawl means thereabout, then pulling on said line other end causes said pawl means to strike said control edge a second time orienting said pawl means whereby releasing said line permits said spring means to drive said pawl means past leading edge returning said carriage and line adjacent said rear panel.

3,906,816
FISHING REEL WITH A DISENGAGEABLE ONE-WAY PAWL AND RATCHET MECHANISM

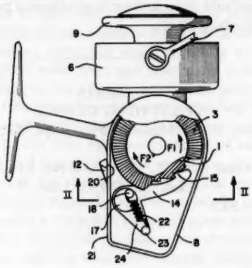
Alain Nepote, Cluses, France, assignor to Mitchell S.A., France

Filed Aug. 30, 1974, Ser. No. 502,183

Claims priority, application France, Oct. 23, 1973, 73.37764

Int. Cl.² G05G *5/00*

U.S. Cl. 74—575 **3 Claims**



1. In a fishing reel comprising a casing and ratchet mounted for rotation in the casing, a pawl mechanism for controlling one-way rotation of the ratchet, said pawl mechanism comprising:

a pawl pivotally mounted in the casing for movement about a pivoting axis between a first position in operative engagement with the ratchet to allow one-way rotation of the ratchet and a second position disengaged from the ratchet;

an external manual control member pivotally mounted on the casing about said pivoting axis of the pawl for movement relative to the pawl;

stop means for limiting pivotal movement of said member between a first postion and a second position;

a piece disposed within said casing and being secured to said control member for rotation therewith;

elongate spring means for moving said pawl between its first and second positions in response to a corresponding movement of said control member between its first and second positions, said spring means having first and second ends and being elastically deformable along the direction between its first and second ends;

means for securing the first end of said spring means to said piece at a first location eccentric to said pivoting axis;

and means for securing the second end of said spring means to the pawl at a second location eccentric to said pivoting axis, said first and second locations being so disposed that during movement of said control member from its first to its second position and from its second to its first position the line joining said first and second locations passes through said pivoting axis.

3,906,817
MULTIPLE SPEED TRANSMISSION

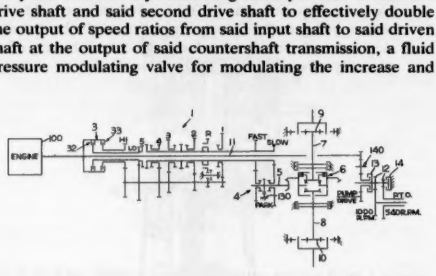
Ernest A. Kreitzberg, Mukwonago, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 17, 1973, Ser. No. 425,314

Int. Cl.² F16H *37/00, 3/08;* **B60K** *20/16;* **F16H** *3/22*

U.S. Cl. 74—740 **10 Claims**

1. A multiple speed transmission for use in a vehicle comprising, a countershaft transmission including a first drive shaft rotatably mounted for rotation about the first axis and driving a first drive gear, a second drive shaft rotatably mounted for rotation about said first axis and driving a second drive gear, a countershaft rotatably mounted for rotation about a second axis, a first and second driven gear connected to said countershaft and directly engaging said first and second drive gears, respectively, a driven shaft rotatably mounted for rotation about said first axis, a plurality of gears mounted for rotation with said driven shaft, a plurality of gears mounted for rotation with said countershaft, a manual clutching means for selectively and alternatively engaging one of said plurality of gears on said driven shaft with one of said plurality of gears on said countershaft, an input shaft, a power shift transmission including a first and second pressurized hydraulic fluid actuated friction clutch including a hydraulic actuator for selectively and alternatively connecting said input shaft to said first drive shaft and said second drive shaft to effectively double the output of speed ratios from said input shaft to said driven shaft at the output of said countershaft transmission, a fluid pressure modulating valve for modulating the increase and



decrease of fluid pressure applied to each hydraulic actuator, manual control means for selectively and alternatively actuating said first and said second pressurized hydraulic fluid actuated friction clutches, said fluid pressure modulating valve increasing fluid pressure to one hydraulic actuator while decreasing fluid pressure to the other hydraulic actuator for shifting said power shift transmission while said input shaft is rotating, a range transmission including at least one high-speed gearset and one-low speed gearset, a range selector for selectively driving the output of said countershaft transmission through said low-speed gearset and said high-speed gearset to thereby quadruple the output of said countershaft transmission.

3,906,818
SINGLE OR MULTI-STEP PLANETARY GEARING

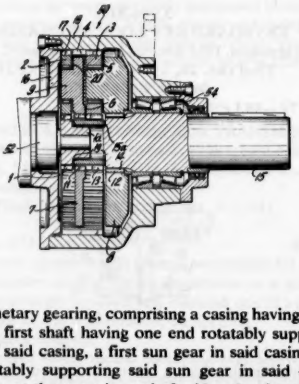
Heinz Benthake, Mulheim (Ruhr), and Josef Kunnen, Dusseldorf-Meerbusch, both of Germany, assignors to Rheinstahl AG, Germany

Filed Feb. 6, 1974, Ser. No. 440,002

Claims priority, application Germany, Feb. 7, 1973, 2305780

Int. Cl.² F16H *1/28*

U.S. Cl. 74—801 **6 Claims**



1. A planetary gearing, comprising a casing having an internal gear, a first shaft having one end rotatably supported in one end of said casing, a first sun gear in said casing, means freely rotatably supporting said sun gear in said casing, a casing cover at the opposite end of said casing from said first shaft, a second shaft journalled in said casing cover, a second sun gear affixed to said second shaft, a plurality of planetary

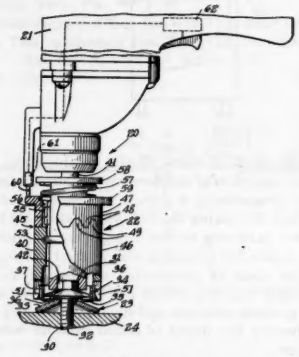
gear carriers having internal gearing arranged in axially spaced relationship with each other in said casing, at least one of said carriers having an internal gear geared to said first shaft and at least one having its internal gear engaged with said first sun gear, each carrier having an axially extending trunnion defining an overhung planetary gear mounting, a planetary gear loosely journalled on each planetary gear mounting, and means defining check shoulders alongside each of said carriers forming bearing contacts engageable with said planetary gearing thereon and retaining said planetary gears on said trunnions against axial movement.

3,906,819

TENSION-RESPONSIVE FASTENER DRIVE SYSTEM

Gary Martin Curtis, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,747
Int. Cl.[2] B25B *27/00*; B25D *23/142*
U.S. Cl. 81—52.4 R **16 Claims**



1. A fastener drive comprising rotatable drive shaft means adapted for driving interconnection with a fastener to drive the fastener into a workpiece, sensing sleeve means rotatable with the drive shaft and adapted for interconnection with a tension sensing gauge actuated by tension in the fastener, at least a portion of the sensing sleeve being inhibited from rotation with the drive shaft when tension in the fastener is sensed by the interconnected gauge, and stop means for halting rotation of the drive shaft when rotation of the sensing sleeve is halted, whereby the fastener is driven into the workpiece until a predetermined amount of tension is experienced in the fastener.

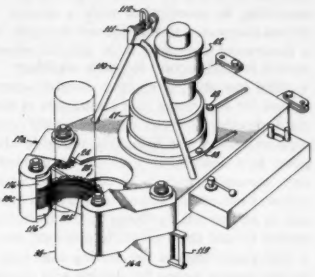
3,906,820

APPARATUS AND METHOD FOR SPINNING PIPE

Ernest D. Hauk, Signal Hill, Calif., assignor to Spinnerhawk Company, Signal Hill, Calif.

Continuation-in-part of Ser. No. 238,069, March 27, 1972. This application Aug. 24, 1973, Ser. No. 391,295
Int. Cl.[2] B25B *17/00*, *13/50*
U.S. Cl. 81—57.17 **21 Claims**

1. Apparatus for spinning pipe, which comprises:
a. a support,
b. first and second jaws movably mounted on said support,
c. power means to close said jaws with a large amount of force,
d. an elongated closed-loop flexible drive element,
said flexible drive element having an external portion and an inverse internal portion disposed within said external portion,
said inverse internal portion being adapted to receive and engage the pipe to be spun,
e. first and second wheels mounted, respectively, on said jaws,
said wheels having extended therearound the return-bent portions at which said external portion of said flexible drive element connects to said internal portion thereof,
f. roller means mounted on said jaws to engage the pipe in response to forcible closing of said jaws by said power means, and to prevent said flexible drive element or said wheels from being damaged or worn due to forcible engagement with said pipe in the vicinity of said wheels; and



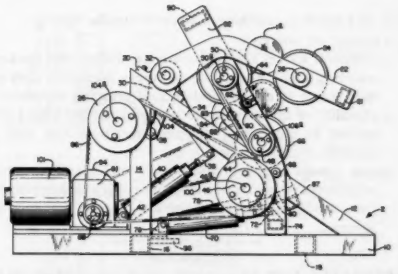
g. means to drive said flexible drive element, and thus effect spinning of said pipe, after said jaws have been closed by said power means,
said drive means also being connected to effect driving of said roller means in such direction that said roller means serve as drive elements for aiding said flexible drive element in spinning said pipe,
said driving of said roller means being such that said roller means impart driving torque to said pipe through the regions of engagement between said roller means and said pipe.

3,906,821

APPARATUS FOR SEPARATING PLASTIC CONTAINERS

Donald F. Schultz, Jr., Irvine, Calif., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed Sept. 18, 1974, Ser. No. 506,989
Int. Cl.[2] B23B *5/14*
U.S. Cl. 82—79 **27 Claims**



1. In an apparatus for separating two cylindrical plastic containers which are joined at their necks, the combination comprising:
a. a support means;
b. a first movable, elongated member pivotally connected to said support means, said first movable member being arcuately movable about said pivot point in a downward direction by a first power-driven cam means operating in

association with a first cam follower means connected to said first movable member and in an upward direction by a first return means connected to said first movable member;

c. a power-driven, rotating means connected to said first movable member for rotating said container about its center axis;

d. a second movable member carrying a keeper means which holds said container in frictional engagement with said rotating means, said second movable, elongated member being pivotally connected to said support means and being arcuately movable about said pivot point in an upward direction by a second power-driven cam means operating in association with a second cam follower means connected to said second movable member and in a downward direction by a second return means connected to said second movable member;

e. a third movable, elongated member carrying a cutting means for separating said containers at their necks, said third movable member being pivotally connected to said support means and arcuately movable about said pivot point in a downward direction by a third power-driven cam means operating in association with a third cam follower means connected to said third movable member, and in an upward direction by a third return means connected to said third movable member; and

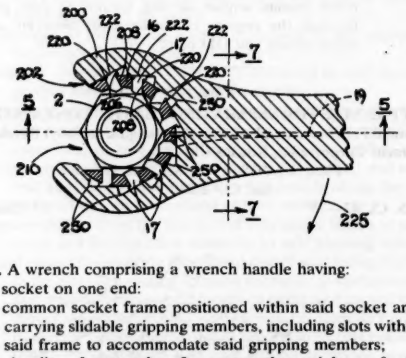
f. a first power means for driving said cam means and a second power means for driving said rotating means.

3,906,822

RATCHET WRENCHES

Nicholas Leslie Hertelendy, and Nicholas Andrew Hertelendy, both of P.O. Box 104, Folsom, Calif. 95630

Filed May 3, 1973, Ser. No. 356,938
Int. Cl.[2] B25B *13/18*
U.S. Cl. 81—91 R **6 Claims**



1. A wrench comprising a wrench handle having:

a socket on one end:

a common socket frame positioned within said socket and carrying slidable gripping members, including slots within said frame to accommodate said gripping members;

a plurality of cammed surfaces upon the periphery of said socket to guide said gripping members and limit their travel;

spring means between said handle and said frame to bias said frame toward a direction wherein said gripping members are forced radially inward against an item to be torqued.

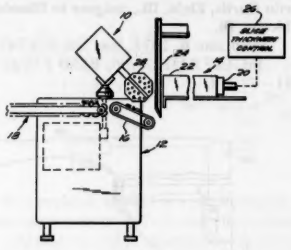
3,906,823

APPARATUS FOR STACKING AND WEIGHING SLICED FOOD PRODUCTS

Robert J. Spooner, Essex, Conn., assignor to Cashin Systems Corporation, Williston Park, N.Y.

Division of Ser. No. 282,651, Aug. 22, 1972, Pat. No. 3,835,742. This application Apr. 3, 1974, Ser. No. 457,480
Int. Cl.[2] B26D *4/46;* **G01G** *13/22*
U.S. Cl. 83—73 **4 Claims**

1. In combination a slicing machine having a slicing blade, a feeding means for feeding the product to be sliced into said blade and control means for determining the rate of advance of said feeding means towards said blade, and consequently, the sliced thickness; apparatus for stacking slices of said product as they are discharged by said slicing machine and then transferring the stacks of sliced product, said apparatus comprising in combination a paddle stacker to be located adjacent to the discharge end of said slicing machine for receiving the slices discharged therefrom, said stacker comprising a pair of mating paddles connected to means for driving each paddle in synchronized opposite directions; weighing means operatively supporting said stacker such that it is adapted to register the weight of the sliced product being stacked thereon; stacker actuating means coupled with said stacker for actuating said driving means to rotate said paddles in opposite directions to



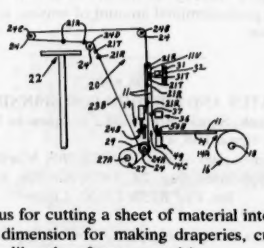
transfer the stack of slices of said product and ready said stacker for reception of another stack of slices; slice counting means for determining a preselected number of slices discharged from the slicing machine for stacking on the stacker; said stacker actuating means being coupled with said slice counting means for actuating said stacker driving means to transfer the stack of preselected number of slices of said product; stack receiving means and conveying means in stack receiving position adjacent said stacker, and being adapted to receive thereon the stacks of sliced product transferred by said stacker.

3,906,824

CUTTING APPARATUS FOR MAKING DRAPERIES, CURTAINS, AWNINGS, AND THE LIKE

Ronald Wade Morgan, 9509 Tiverton Way, Louisville, Ky. 40222, and David L. Witherspoon, P.O. Box 23182, Anchorage, Ky. 40223

Filed Jan. 31, 1975, Ser. No. 546,020
Int. Cl.[2] B26D *5/24, 5/42*
U.S. Cl. 83—81 **10 Claims**



1. Apparatus for cutting a sheet of material into a segment of a desired dimension for making draperies, curtains, awnings, and the like, therefrom, comprising:

a. support means having a first end and a second end opposite from said first end and an opening therethrough between said ends;

b. supply means mounted adjacent to said first end of said support means for supplying a sheet of material;

c. clamp means mounted adjacent to said second end of said support means for clamping a leading edge of said sheet of material thereto;

d. conveyor means including a conveyor section extending

through said support means opening and being engageable with the underside of said sheet of material between said supply means and said clamp means;

e. conveyor drive means for driving said conveyor means to cause a portion of said sheet of material to be disposed on said conveyor section over said support means opening in an inverted generally U-shape;

f. first control means for energizing said conveyor drive means;

g. second control means for de-energizing said conveyor drive means when the height above said support means opening of the bight of said inverted generally U-shape reaches a desired level; and

h. cutter means for severing the trailing edge of said inverted generally U-shape of said sheet of material from said supply means.

3,906,825

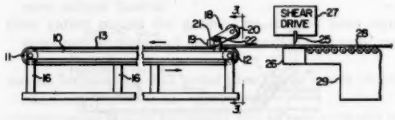
BELT SHEARLINE HAVING METERING ROLLER

George E. Schenck, Dallastown; Robert L. Schenck, and Frank W. Senft, both of York, all of Pa., assignors to Schenck Corporation, York, Pa.

Continuation-in-part of Ser. No. 478,172, June 10, 1974, abandoned. This application Jan. 17, 1975, Ser. No. 542,009

Int. Cl.² B23Q *7/00;* **B26D** *5/20*

U.S. Cl. 83—155.1 **10 Claims**



1. An apparatus for measuring and cutting elongated stock comprising the combination of

an elongated frame;

an endless conveyor belt;

means for mounting said belt for movement on said frame to form a conveyor;

means for driving said belt in a direction to carry articles from an inlet end toward an outlet end of said conveyor;

an abutment plate;

a work-holding roller having an axis of rotation;

bracket means for supporting said plate and said roller;

means for pivotally mounting said bracket means on said frame with said plate and the axis of said roller perpendicular to the direction of motion of said belt;

means for pivoting said bracket means between a first position in which said plate is adjacent to said belt and said roller is spaced from said belt a distance sufficient to permit the passage of stock on said belt, and a second position in which said plate is spaced from said belt a distance sufficient to permit the passage of stock and said roller is spaced from said belt by a distance determined by the thickness of stock placed thereon so that said roller is rotated by contact with stock carried by said belt;

means for producing signals representative of the amount of longitudinal motion of the stock carried by said belt when said bracket means is in said second position; and

shear means mounted a predetermined distance from said plate and spaced from the inlet end of said conveyor to cut said stock.

3,906,826

WORKPIECE INDEXING APPARATUS FOR MACHINE TOOLS

Roy M. Middendorf, Greensburg, Ind., assignor to BMR Enterprises, Greensburg, Ind.

Filed Mar. 29, 1974, Ser. No. 456,075

Int. Cl.² B26D *7/06;* **B26F** *1/40*

U.S. Cl. 83—267 **10 Claims**

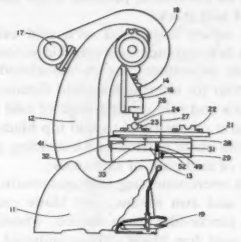
1. A workpiece handling apparatus comprising:

a workpiece holder mounted to a base for rotation about an axis;

an actuator coupled between said holder and said base and operable when actuated to rotate said holder;

and coupling means coupled between said holder and said actuator to provide a high mechanical advantage of said actuator over said holder at the beginning and end of the motion of said holder caused by said actuator;

said coupling means including first and second gear racks and first and second pinions, said first rack being connected to said actuator and linearly operable thereby,



said first pinion being engaged by said first rack for rotation thereby upon linear movement of said first rack, eccentric drive means connected to said first pinion for rotation by said pinion in response to rotation of said first pinion by said first rack, said second rack being coupled to said eccentric and drivable by said eccentric as said actuator drives said first pinion, said second pinion being coupled to said holder and engaged by said second rack and said holder being rotatable by said second pinion as said second pinion is rotated by said second rack whereby said holder is rotated about said axis.

3,906,827

FLYING SHEAR

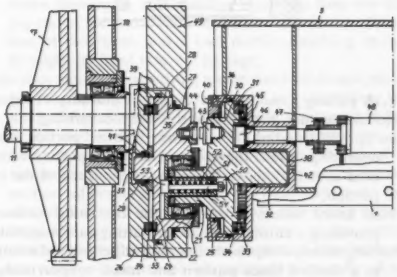
Manfred Fritz, Erkrath, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Duesseldorf, Germany

Filed Apr. 22, 1974, Ser. No. 463,165

Claims priority, application Germany, Apr. 21, 1973, 2320509

Int. Cl.² B26D *1/56*

U.S. Cl. 83—299 **16 Claims**



1. A flying shear for cutting stock moving along a defined path, the flying shear comprising:

a stand;

top and bottom blade carriers;

top and bottom shear blades mounted by respective said carriers, said blades having respective cutting edges;

crank means rotatably mounted in said stand for rotation about a crank axis;

co-acting first and second pivotal interconnecting means, said first and second pivotal interconnecting means being rotatable relative to one another about a second axis parallel to but spaced from said crank axis, said first pivotal interconnecting means being mounted on said crank means and said second pivotal interconnecting means being mounted on said top blade carrier, thereby to pivotally interconnect said crank means and said top blade carrier and thereby to move said top blade carrier in a closed path in which said top blade carrier approaches its lowermost position when moving in the direction of said stock;

adjustment means associated with said crank means for altering a first distance between said second axis and said crank axis; adjustment means associated with said top blade carrier for altering a second distance between said second axis and said cutting edge of said first blade;

respective arm means fixed to said top blade carrier and to said bottom blade carrier, and extending generally in the direction of said path of said stock;

pivot means interconnecting said arm means, thereby forming with said arm means, said blade carriers and said blades a pincer-like shear device, whereby said movement of said top blade carrier induced by said crank means causes said bottom blade carrier to follow said movement of said top blade carrier in the direction of said stock; and

rocker means fixed to said bottom blade carrier and rockably mounted on said stand.

3,906,828

HAMMER ACTUATED CLICKER DIE PRESS

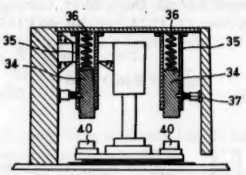
Seiichi Suzuki, Ota, Japan, assignor to Daisuzu Meriyasu Kogyo Kabushiki Kaisha, Japan

Filed Oct. 5, 1973, Ser. No. 403,979

Claims priority, application Japan, Oct. 7, 1972, 47-100868; Nov. 29, 1972, 47-138048; Nov. 29, 1972, 47-138049; Dec. 29, 1972, 48-643

Int. Cl. B26d *5/08*

U.S. Cl. 83—539 **6 Claims**



1. A cutting apparatus for cutting a plurality of layers of materials, textiles, leather and the like, comprising:

an upright standing frame having a lower portion with an operating surface thereon and an upper portion cantilevered over and above the operating surface of the lower portion;

base board means located on the operating surface for providing a cutting surface for cutting said materials;

cutting means comprised of cutting edges formed according to a desired block pattern and metal support rods and plates for framing said cutting edges in the desired pattern, said cutting means being placed on the material to be cut after the material is laid on said base board;

hydraulic press means mounted on said upper frame portion and cantilevered over said operating surface, said hydraulic press means having a top platen mounted thereto and opposed to said base board, said top platen being lowered into contact with said cutting means placed on said material by the downward motion of said hydraulic press means,

adjustable leveling means located on said top platen for keeping said top platen level,

plunger hammer means for supplying the force necessary to completely cut through said material, said plunger hammer means affixed to and hanging downward from said upper portion of the upright standing frame;

anvil means operatively positioned on said top platen to receive the force of the downward motion of said plunger hammer means after said top platen has been lowered into contact with said cutting means, said downward motion of the plunger hammer means against the anvil means being sufficient to cause the top platen to exert against the cutting means the force necessary to completely cut the layers of material into the shape of the cutting means.

3,906,829

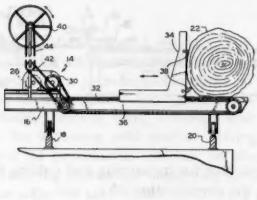
LOG POSITIONERS

Paul J. Westfall, 4444 W. Burnside St., Portland, Oreg. 97210

Continuation-in-part of Ser. No. 264,739, June 21, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,288

Int. Cl. B27b *7/00, 29/10*

U.S. Cl. 83—723 **2 Claims**



1. In combination,

feeler means at a sawline having a log contact member,

setwork means for advancing a log laterally toward and past the feeler means,

means responsive when the contact member is engaged by the forward side of the log for indicating a position of the log in which the forward side of the log is at the sawline, and retracting means for lowering the contact member out of the path of the log to permit the setworks means to advance the log beyond said position, the retracting means comprising a cylinder for raising the contact member to an extended position in the path of a log and for lowering the contact member to a retracted position out of the path of a log, said responsive means including sensing means responsive to the contact of the log with the contact member for giving an indication of the contact.

3,906,830

MONOPHONIC ELECTRONIC MUSICAL INSTRUMENT

Robert George Mathias, Brookfield, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed Mar. 4, 1974, Ser. No. 447,907

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.01 **12 Claims**

1. A monophonic electronic musical instrument comprising:

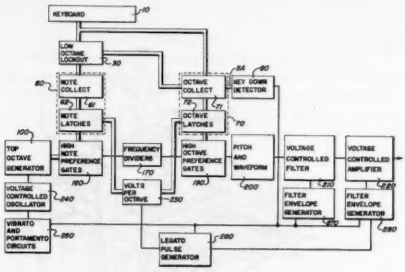
a plurality of selectively actuable control elements for producing control signals on separate output leads, each control signal element being associated with a particular note of the musical scale in one of a plurality of octaves;

means for collecting control signals associated with common notes in different octaves on common note busses;

means for collecting control signals associated with common octaves on common octave busses;

tone signal generating means for generating at least the highest octave of tone signals on separate tone signal busses;

note memory means coupled to said common note busses for storing control signals appearing on said common note busses;



octave memory means coupled to said common octave busses for storing control signals appearing on said common octave busses;

note gating means for gating one of said tone signals in response to a control signal stored in said note memory means;

means for dividing said gated tone signal into a plurality of octavely related tone signals; and

octave gating means for gating one of said octavely related tone signals in response to a control signal stored in said octave memory means.

3,906,831

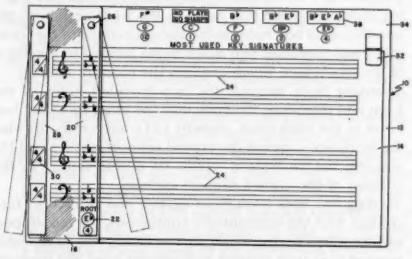
MUSIC WRITING BOARD

Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710

Filed July 24, 1974, Ser. No. 491,259

Int. Cl.² G09B *15/02*

U.S. Cl. 84—475 **6 Claims**



1. A music composition aid comprising:

a. a frame including a planar portion to serve as a writing surface for a sheet of musical staff paper;

b. a plurality of selectively exposable members mounted on a left hand portion of said frame, each of said members having a representation thereon of the incidentals of a particular key signature spaced to align with the corresponding lines and spaces of a staff on a sheet of staff paper disposed on said writing surface;

c. releasible clip means mounted on said frame to engage a piece of staff paper and locate same such that the lines and spaces thereof align with the incidentals of the particular key signature, whereby a plurality of sheets of staff paper may be sequentially used on said aid.

3,906,832

FIXING DEVICES FOR BEING DRIVEN INTO AND ANCHORED IN MATERIAL

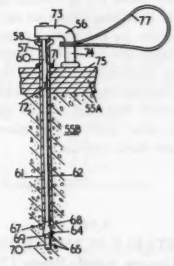
Peter Louis Lunn, Hartford; Alan Roy Peters, Sevenoaks, both of England, and George Samuel Webster, Rhyl, Wales, assignors to Lunweb (Products) Limited, Aylesbury, England

Continuation-in-part of Ser. No. 217,578, Jan. 13, 1973, abandoned. This application Nov. 12, 1973, Ser. No. 414,650

Claims priority, application United Kingdom, June 14, 1971, 27780/71; Sept. 16, 1971, 43274/71

Int. Cl.² F16B *15/04*

U.S. Cl. 85—26 **5 Claims**



1. A fixing device assembly for being driven already assembled into autoclaved aerated concrete and like low density constructional material, forming its own cavity thereby in said material;

the fixing device assembly comprising:

an elongate shank and a pilot member;

the shank having a leading end and a rear end and comprising:

a plurality of side-by-side part-tubular elongate sections forming in combination a substantially tubular leading end portion of the shank and extending from the leading end towards the rear end of the shank; means integrally, permanently and rigidly interconnecting rear ends of said sections; said sections being separated from each other forwardly of the rear ends of said sections by slits extending continuously from adjacent the rear ends of said sections between side edges of said sections along said leading end portion, said slits opening onto the leading end of the shank;

said sections being adapted to be capable of being flexibly splayed apart from each other forwardly of their rear ends; the shank also comprising a head at its rear end; the shank forming an axial passage extending from the leading end of the shank and between said sections to the rear end of the shank and a tool portion-receiving opening through the head into the passage;

the pilot member comprising a stem received in said passage between said sections of the shank and comprising a bit integral with the stem, said bit being positioned in front of the leading end of the shank; a rear end of the stem being positioned in the shank passage forward of the opening in the shank head; the bit comprising a rearward portion adjoining said stem and a wide part at the front of said rearward portion, said wide part being substantially the same width in cross-section as the external cross-section of the leading end portion of the shank, said rearward portion of the bit tapering rearwardly of said wide part towards said stem;

the pilot member bit being characterised in that it comprises a forward portion adjoining said wide part and tapering forwardly of said wide part towards a narrow leading end of the pilot member bit, whereby the pilot member bit can punch a cavity passage in said constructional material both for the bit itself and for the shank when a tool portion is engaged through the opening in the shank head

with the rear end of the pilot member stem and concussive drive is applied thereto, with the pilot member and shank already assembled together;

the shank being forwardly drivable from an initial position relative to the bit for engagement of the shank sections by said rearward portion of the bit to cause splaying apart of said shank sections, subsequent to the punching of said cavity passage by the pilot member bit;

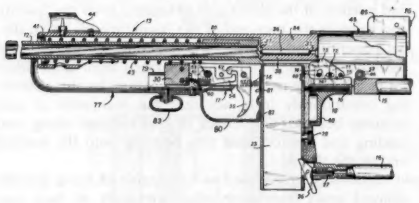
the shank sections being adapted to individually penetrate the constructional material endwise after being splayed apart, thereby enlarging for themselves the cavity in the constructional material, and to grip the pilot member bit between their side edges;

the pilot member stem being characterised by being sufficiently shorter than the shank so that the rear end of the stem will remain in the shank passage forward of the shank head after the assembly has been driven into the constructional material; whereby the pilot member can be protected by the shank from accidental direct impact tending to loosen the grip by the shank sections on the pilot member after said tool portion has been removed from the shank head opening.

3,906,833
PORTABLE SUBMACHINE GUN

Hector Mendoza Orozco, Adolfo Prieto 1709, Mexico 12, D. F., Mexico

Filed Jan. 14, 1974, Ser. No. 433,162
Claims priority, application Mexico, Jan. 31, 1973, 141299
Int. Cl.[2] F41D *11/00*
U.S. Cl. 89—196 3 Claims



1. An improved portable submachine gun comprising in combination:

a. a support structure having upper and lower edges and front and rear ends;

b. firing and safety means fixed to said support structure;

c. a retaining device for a magazine connected to said support structure;

d. a stock attached to the rear end of the support structure and to said magazine retaining device;

e. a barrel fixed to said support structure and having a cartridge receiving chamber at one end; and

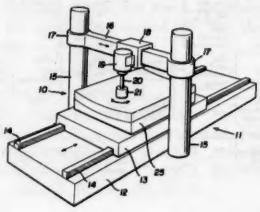
f. a bolt slidingly mounted on said barrel and having guiding means removably attached to the rear end of said support structure;

in which said support structure comprises an H shaped member having its joining or saddle portion near its front end in the form of an upwardly projecting channel in which the barrel is secured, and having a central widened portion in which the magazine retaining device is secured.

3,906,834
METHOD OF FORMING LARGE RADIUS CURVES ON PLATE SURFACES

Floyd R. Gladwin, P.O. Box 1113, Southgate, Mich. 48192

Filed Apr. 4, 1974, Ser. No. 458,000
Int. Cl.[2] B23C *3/00, 3/16*
U.S. Cl. 90—11 C 1 Claim



1. A method of forming a continuous curved surface on a face of a large, substantially flat, plate-like workpiece formed of a relatively resilient material, by removing material from one surface of the workpiece, comprising the sequential steps of:

1. forming a curved shape, substantially continuous workpiece support surface on a form, said support surface being closely shaped to the desired curved surface contour and curvature dimensions and having a configuration conjugate to the curved surface on the finished workpiece, and said form having a plurality of through, non-threaded bolt holes extending to the substantially continuous curved surface contour;

2. positioning a workpiece on the support surface and aligning blind, threaded bolt holes in the workpiece with the non-threaded bolt holes in the curved surface of the form; said blind threaded bolt holes being formed in a surface of the workpiece which engages the support surface;

3. inserting bolts through the non-threaded holes of the form and threading the bolts into the blind threaded bolt holes in the workpiece, thereby (a) transversely drawing the workpiece against the curved support surface and (b) bending the workpiece within its elastic limits, to the contour of the curved support surface;

4. holding the bent workpiece against and in face to face contact with the substantially continuous, curved support surface whereby the workpiece is firmly and immovably supported in such contact and remains bent, the opposite face of the workpiece being exposed and having a shape substantially the same as the substantially continuous support surface;

5. physically removing material from the exposed face of the workpiece to form such exposed face into a substantially flat continuous, planar shape; and

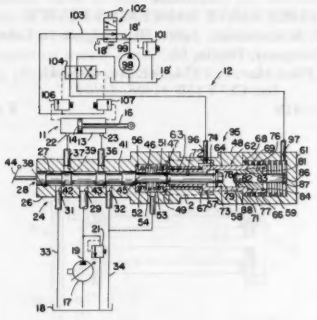
6. then unthreading the bolts from the threaded bolt holes in the workpiece to release the workpiece from the substantially continuous curved supported surface and permitting it to resiliently bend back into its original unbent condition, to thereby cause the exposed face to spring into a curved form corresponding to the desired curved surface which is substantially conjugate to the curved shape surface of the form.

3,906,835

FLUID MOTOR CONTROL SYSTEM WITH MANUAL AND SELF-CYCLING MODES OF OPERATION

Ronald L. Downen, Plainfield, and Leon E. Hicks, Joliet, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Jan. 14, 1974, Ser. No. 432,967
Int. Cl.[2] F01L *25/06*
U.S. Cl. 91—308 10 Claims



1. A control system for a fluid pressure operated motor having a first port which may be pressurized to produce motor operation in one direction and having a second port which may be pressurized to produce motor operation in an opposite direction, comprising:

a motor control valve having a pressurized fluid inlet and drain means and first and second outlets for connection to said first and second motor ports respectively, said control valve further having a valving element shiftable between at least three positions including a first position at which both of said outlets are closed and a second position at which said first outlet is communicated with said inlet and a third position at which said second outlet is communicated with said inlet,

means for manually shifting said valving element between said positions thereof,

an actuator means having a bore therein and having first and second fluid passages communicated with said bore, a valving element extension connected to said valving element of said control valve for movement therewith and extending into said bore of said actuator means,

a piston in said actuator means shiftable by pressurized fluid admitted to said first passage thereof and having means for engaging said valving element extension, to force said valving element to said second position thereof only after said piston has travelled relative to said valving element a distance at least equal to the movement needed to shift said valving element from said first to said second position thereof,

second means in said actuator means shiftable in an opposite direction in response to pressurization of said second passage of said actuator means and having means for engaging said valving element extension to force said valving element to said third position thereof only after said second means has travelled relative to said valving element a distance at least equal to the movement required for shifting said valving element from said first to said third position thereof, and

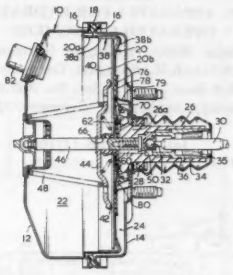
means for alternately pressurizing said first and second passages of said actuator means to cause said control valve to cyclically reverse the direction of operation of said motor.

3,906,836

SERVO-BOOSTERS FOR VEHICLE BRAKING SYSTEMS

Alexander John Wilson, Sutton Coldfield, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 27, 1973, Ser. No. 391,532
Claims priority, application United Kingdom, Sept. 8, 1972, 41763/72
Int. Cl. F15b *9/10;* F01b *19/00;* F16j *3/00*
U.S. Cl. 91—369 B 7 Claims



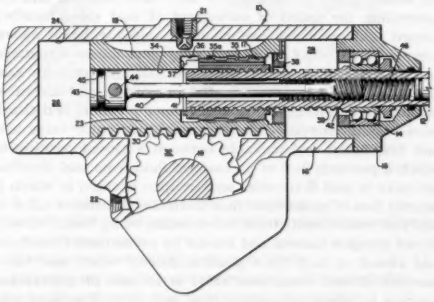
1. A differential-pressure operated servo booster, of the type in which a load actuating member is displaceable by the application of differential fluid pressure across a movable wall, including a valve arranged to selectably alter the pressure on one side of the movable wall relative to that on the other side, the valve comprising a valve body member, a flexible, annular closure member adapted to co-operate with a pair of relatively stationary and substantially concentric annular valve seats on the valve body member, and an annular deflecting plate for selectably deflecting the closure member about the valve seats to control said differential fluid pressure across the wall, wherein a means is provided which forms a mechanical connection between the valve body member and the deflecting plate at a location radially outwardly of the annular valve closure member for transmitting input loads applied to the booster directly from the valve body member to the deflecting plate.

3,906,837

POWER STEERING GEAR WITH TORSION ROD VALVE CENTERING MECHANISM

Richard H. Sheppard, c/o R. H. Sheppard Co., Inc., Hanover, Pa. 17331

Filed Dec. 27, 1973, Ser. No. 428,727
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—378 5 Claims



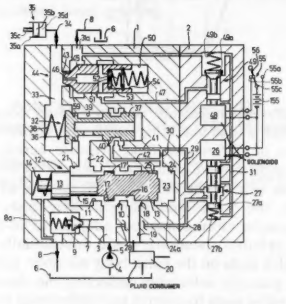
1. In a power steering device including a housing, rotatable input and output shafts carried by said housing, a piston slidable within said housing and coupled in driving relationship to said output shaft, a spool valve translatable within said piston,

hydraulic means for sliding the piston in response to the translation of the spool valve, and said input shaft including a threaded portion passing through said spool valve and in threaded engagement with the valve for translating the same, the improvement comprising a torsion rod within said input shaft, a first end of said torsion rod being connected to said piston and means for coupling the second end of said torsion rod to said shaft so as to cause centering of said valve.

3,906,838
CONTROL APPARATUS FOR HYDRAULICALLY OPERATED CONSUMERS

Friedrich-Wilhelm Höfer, Hofingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 4, 1973, Ser. No. 367,012
Claims priority, application Germany, July 5, 1972, 2232857
Int. Cl.² F15B *11/16*
U.S. Cl. 91—413 14 Claims

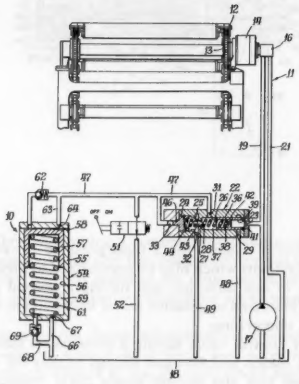


1. Apparatus for controlling the flow of pressurized hydraulic fluid to fluid consumer motors, particularly to consumer motors mounted on or towed by an agricultural vehicle, comprising first and second consumer motors; a source of pressurized fluid; a housing including means defining an inlet connected to said source and first and second outlets respectively connected with said first and second fluid consumer motors; a reservoir; a distributor valve interposed between said inlet and said outlets and having a valve member movable between a plurality of positions including a predetermined position in which pressurized fluid is free to flow from said inlet towards said first outlet, said valve member being arranged to establish a path for the flow of fluid from said inlet to said second outlet in at least some other positions thereof; and regulating means for initiating the movements of said valve member and for controlling the speed of movement of said valve member toward said predetermined position, said regulating means comprising a control chamber, a pilot valve means actuatable to connect said chamber with said reservoir or with said source to thereby respectively effect a movement of said valve member to and from said predetermined position, and check valve means interposed between said distributor valve and said first outlet and movable between a closed position in which it prevents flow of pressurized fluid from said distributor valve to said first outlet and an open position in which it permits flow of pressurized fluid from said distributor valve to said first outlet, said check valve means being biased to said closed position thereof and moved by pressurized fluid from said closed to said open position thereof when said valve member of said distributor valve is in said predetermined position in which pressurized fluid is free to flow from said inlet through said distributor valve towards said first outlet; and flow reducing means for reducing the rate of fluid flow from said control chamber to said reservoir while said pilot valve means is actuated to connect said control chamber with said reservoir, said flow reducing means being movable between an inoperative position in which it does not affect the flow of fluid from said control chamber to said reservoir and an operative position in which it reduces the rate of flow of fluid from said control chamber to said reservoir, said flow reducing means being connected to said check valve means in such a manner so as to be moved into operative position when said check valve means is in open position and to be moved into inoperative position when said check valve means is in closed position.

3,906,839
RELIEF VALVE DAMPENING DEVICE

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Mar. 7, 1974, Ser. No. 448,841
Int. Cl.² F15B *11/08, 13/04*
U.S. Cl. 91—418 8 Claims



1. In a pressure-responsive dump valve having a control chamber with pressure-responsive means to vent said chamber and manual control means to selectively vent said chamber to effect opening of said valve, the improvement comprising:

accumulator means comprising means defining an enclosed cylinder;

a piston reciprocally disposed in said cylinder for defining a first variable chamber and biased by spring means toward one end thereof;

an inlet port opening into said first variable chamber and including restriction means; and,

an outlet port opening into said first variable chamber and including one way check valve means, fluid conduit means connecting said inlet and outlet ports with said control chamber.

3,906,840
HYDRAULIC CONTROL SYSTEM FOR LOAD SUPPORTING HYDRAULIC MOTORS

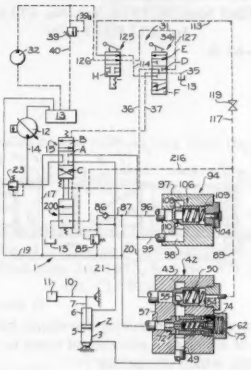
Donald L. Bianchetta, Coal City; Kenneth R. Lohbauer, Joliet, and Sammy J. Rhodes, Aurora, all of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Continuation-in-part of Ser. No. 244,822, April 17, 1972, Pat. No. 3,805,678. This application Jan. 28, 1974, Ser. No. 437,383
Int. Cl.² F15B *11/08, 13/042*
U.S. Cl. 91—445 5 Claims

1. A load supporting fluid system comprising:

load supporting means including a fluid motor for raising and supporting a load, said motor having a load supporting end including a fluid chamber;

a source of pressurized fluid for operating said motor;
means including a pilot operated directional control valve for selectively communicating pressurized fluid between said source and motor for raising, lowering and positioning said load supporting means;
said directional control valve comprising a housing, an elongated valve spool reciprocably mounted in a bore in said housing for communicating with inlet and outlet ports for defining raise, lower, and hold positions;
load check valve means disposed between said control valve and said motor for permitting free flow of fluid from said control valve to said motor and for normally blocking flow of fluid from said motor to said control valve;
said check valve means having a control chamber including restriction means communicating with said load supporting chamber, and said check valve means being responsive to fluid pressure in said load supporting chamber to bias said valve means to said fluid blocking position; and vent valve means including a valve spool mounted in a bore coaxially with said directional control valve spool at one end thereof and engageable by abutment thereby upon shifting of said directional control valve spool to said lower position to vent said control chamber to effect opening of said check valve to permit flow of fluid from said load supporting chamber to effect lowering of said load supporting means, said vent valve means comprises a separate housing, means detachably securing said vent valve housing to said control valve housing, and said vent valve spool comprises a spring biased closed cylindrical spool having an annular groove for communicating between a first port in communication with said control chamber and a second port in communication with a sump.

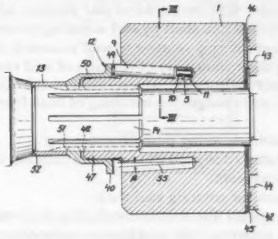


3,906,841
AXIAL-PISTON MACHINE

Walter Heyl, Oberafferbach, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 6, 1973, Ser. No. 386,012
Claims priority, application Germany, Aug. 4, 1972, 2238582
Int. Cl.[2] F01B *1/00*
U.S. Cl. 91—487 **3 Claims**

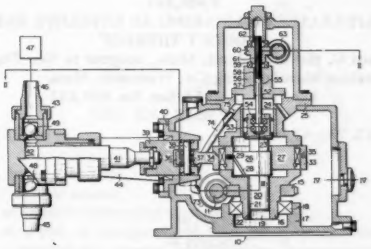
1. In an axial piston machine having a shaft, a cylinder drum coupled with said shaft for rotation therewith, a plurality of working cylinders formed in said cylinder drum in an annular array, respective working pistons received in said working cylinders and axially shiftable therein while bearing upon an inclined surface at one side of said cylinder drum, and a fluid-distribution surface extending transverse to the axis of said cylinder drum at the other side thereof and communicating with said working cylinders, the improvement wherein said cylinder drum is formed with a plurality of pressing cylinders within said array each communicating with at least one of said working cylinders for pressurization thereby, a pressing piston received within each of said pressing cylinders and displaceable therein, and an annular abutment retained on said shaft against axial displacement away from said fluid-distribution surface and engaged by said pressing pistons whereby said cylinder drum is urged in the direction of said fluid-distribution surface, said abutment rotating with said shaft, each of said working cylinders being connected to a respective pressing cylinder by a respective connecting passage formed in said cylinder drum, each of said working cylinders being formed with a guide bushing at said side of said cylinder drum, each of said connecting passages opening into the respective working cylinder behind the respective guide bushing.



3,906,842
VARIABLE METERING PUMP

Kiyomi Sonobe, Tokyo, Japan, assignor to Iwaki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 327,303, Jan. 29, 1973, abandoned. This application June 5, 1974, Ser. No. 476,732
Claims priority, application Japan, Jan. 31, 1972, 47-12948[U]
Int. Cl.[2] F01B *31/14*; F15B *15/24*
U.S. Cl. 92—13.1 **12 Claims**



1. A variable metering pump comprising:
a main shaft so designed as to make a rotation as well as an axial movement;
drive means for rotating said main shaft;
adjusting means for axially displacing said main shaft;
a double eccentric cam mechanism comprising:
an eccentric disk fixed to said main shaft,
an eccentric ring having its inner peripheral wall engaged with the outer peripheral wall of said eccentric disk and positioned eccentrically with respect to said eccentric disk; and

coupling means for connecting said eccentric ring to said eccentric disk, said coupling means comprising:

a helical keyway cut out in the outer peripheral wall of said eccentric disk; and

a ball-shaped projection protruding from the inner wall of said eccentric ring and engaging with said keyway;

a plunger coupled to the periphery of said eccentric ring for producing a reciprocating stroking movement upon rotation of said main shaft by said drive means; and

a pump unit coupled to said plunger for metering a fluid in accordance with the stroke of said plunger, whereby axial movement of said shaft by said adjusting means will rotate said eccentric ring relative to said eccentric disk thereby varying the eccentricity of rotation of said ring when said drive shaft is rotated, which changes the stroke of said plunger and changes the metering of fluid from said pump unit.

7. A variable metering pump comprising:

a main shaft so designed as to make a rotation as well as an axial movement;

drive means for rotating said shaft;

adjusting means for axially displacing said main shaft; a double eccentric cam mechanism comprising:

an eccentric disk fixed to said main shaft,

an eccentric ring having its inner peripheral wall engaged with the outer peripheral wall of said eccentric disk and positioned eccentrically with respect to said eccentric disk; and

coupling means for connecting said eccentric ring to said eccentric disk, said coupling means comprising:

a plurality of helical spline grooves cut out in the inner peripheral wall of said eccentric ring, and a plurality of helical spline teeth protruding from the outer peripheral wall of said eccentric disk and engaging with said spline grooves;

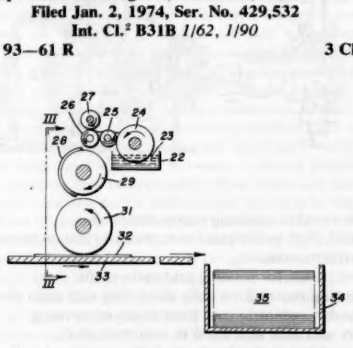
a plunger coupled to the periphery of said eccentric ring for producing a reciprocating stroking movement upon rotation of said main shaft by said drive means; and

a pump unit coupled to said plunger for metering a fluid in accordance with the stroke of said plunger whereby axial movement of said shaft by said adjusting means will rotate said eccentric ring relative to said eccentric disk thereby varying the eccentricity of rotation of said ring when said drive shaft is rotated, which changes the stroke of said plunger and changes the metering of fluid from said pump unit.

3,906,843
APPARATUS FOR MAKING AN ENVELOPE AND PRODUCT THEREOF

Edward G. Hewitt, Auburn, Mass., assignor to New England Envelope Manufacturing Co., Worcester, Mass.

Filed Jan. 2, 1974, Ser. No. 429,532
Int. Cl.[2] B31B *1/62, 1/90*
U.S. Cl. 93—61 R **3 Claims**



1. Apparatus for modifying an envelope which is a product of a means for forming an envelope from a blank, including an applicator for applying a remoistenable gum to a flap and a drier for drying the adhesive, comprising:

a. a gum applicator for generating a very thin layer of gum,

b. a picker having a pattern to which the layer of gum is transferred,

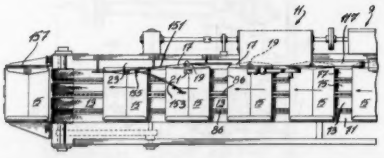
c. a roller contacting the pattern occasionally and receiving the layer of gum therefrom for transfer to the envelope on the back thereof, the width of the roller being substantially greater than that of pattern, so that any bead of gum is transferred from the pattern to the roller, is deposited on an intermediate portion of the roller and is crushed by contact of the roller with the surface of the envelope, and

d. means for stacking the envelope immediately after it receives the said layer of gum.

3,906,844
METHOD AND APPARATUS FOR PRODUCING ENVELOPES HAVING A CLOSURE FLAP

Robert Gougeon, Montreal, Canada, assignor to International Envelope, Limited, Montreal, Canada

Filed May 28, 1974, Ser. No. 474,139
Int. Cl.[2] B31B *1/90*
U.S. Cl. 93—61 B **23 Claims**



1. An apparatus for producing envelopes having a closure flap capable of adhering a plurality of times to the main body of the envelope which comprises:

a. a conveyor which is adapted for moving said envelopes one by one from one end to the other end of said apparatus,

b. means operative to open said closure flap as said envelope is being moved along by said conveyor,

c. means to cut an opening in said flap,

d. means for fixing on said envelope a band of material having a glossy surface, said band of material being disposed in a position corresponding to the closed flap opposite said opening, and,

e. means for fixing an adhesive tape on said flap over the said aperture.

3,906,845
PUMP SEAL

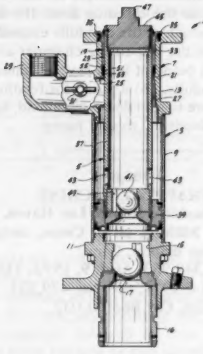
Jerome B. Wegmann, St. Louis, Mo., assignor to McNeil Corporation, Akron, Ohio

Filed Jan. 7, 1974, Ser. No. 431,061
Int. Cl.[2] F16J *15/18;* **F04B** *21/04*
U.S. Cl. 92—168 **6 Claims**

1. A pump comprising a cylinder, a plunger reciprocable in the cylinder,

a head at one end of the cylinder having an opening for the plunger, the head having an annular shoulder facing outwardly in the opening, a bushing in the opening having its inner end spaced from the shoulder, a resilient elastomeric ring, an expandable packing ring, and a packing expanding ring between the inner end of the bushing and the shoulder, the packing expanding ring being seated on the shoulder, the packing ring engaging the packing expanding ring and being expandable radially inwardly into sealing engagement with the plunger and radially outwardly into engagement with the head by being forced against said expanding ring, and the resilient elastomeric ring being under compression between the inner end of

the bushing and the packing ring to force the packing ring against said expanding ring, said resilient elastomeric ring



being sealed by the packing ring from the material being pumped

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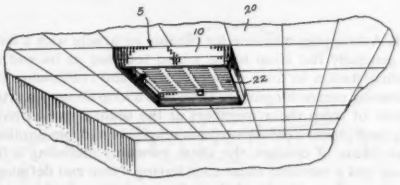
3,906,846

DIRT CONTROL SHIELD FOR AN AIR OUTLET

Charles C. Day, 1235 Byron Dr., South Bend, Ind. 46614

Filed June 20, 1973, Ser. No. 371,749
Int. Cl.[2] F24F *7/06*
U.S. Cl. 98—40 D **3 Claims**



1. A shield mounted about an airflow outlet in a room wall for reducing the accumulation of air carried dirt upon said room wall adjacent said outlet, said shield comprising a side wall surrounding said outlet and extending substantially perpendicularly outwardly from said room wall, said shield including a deflector plate means carried at the inside of said side wall spaced from said room wall, said side wall having a plurality of openings formed therein, said deflector plate means extending around said outlet and projecting outwardly from the inside of said side wall and away from said room wall wherein a portion of the air from said outlet contacts said deflector plate means and is diverted laterally through said openings in the side wall and parallel adjacently along said room wall.

3,906,847

COFFEE EXTRACTING APPARATUS

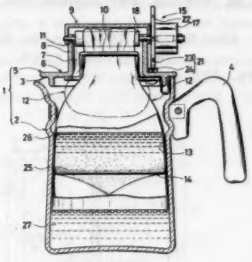
Tamotsu Itasaka, and Fumiko Itasaka, both of Robby Coffee Shop, 37, Sanae-cho, Moriguchi, Japan

Filed Sept. 6, 1973, Ser. No. 394,665
Int. Cl.[2] A47J *31/00*
U.S. Cl. 99—287 **7 Claims**

1. An apparatus for extracting coffee rich in flavor while preventing, as much as possible, the oxidation of the coffee due to the air of the hot water dissolved out the coffee extract, comprising:

a. a vessel opened at its top, with a pouring mouth and handle provided thereon and

b. a cover which is adapted to fit the opening of the vessel, and a bearing cylinder means opened at its top and bottom and projecting upwardly from said cover, and



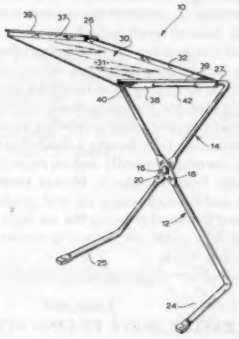
c. a take-up mechanism on the vessel supported for operation on the bearing cylinder, and operative to pull toward the opened top of the vessel, an extraction bag having a filtering bottom being inserted in the vessel through the take-up mechanism, while being squeezed at its mouth by the said mechanism.

3,906,848

TOAST-HOLDING STAND

Edward John Gow, Apt. No. 101, 190 Exbury Rd., Downsview 464, Ontario, Canada

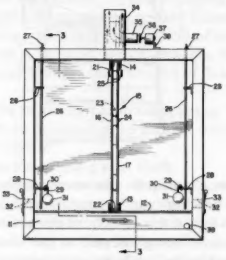
Filed June 18, 1973, Ser. No. 371,180
Int. Cl.[2] A47J *36/24*
U.S. Cl. 99—339 **14 Claims**



1. In combination:
an electric toaster;
a collapsible supporting structure comprising:
a. a pair of elongated legs disposed generally vertically behind said toaster and pivotally interconnected between their ends so as to be movable between a closed position and an open position in which they are more angularly separated than when in said closed position,
b. first and second feet extending forwardly and generally horizontally beneath said toaster from lower ends of respective ones of said legs, and
c. first and second arms extending generally forwardly over said toaster from respective ones of said legs at their upper ends; and
a thermally conductive and heat-retaining plate removably supported on said first and second arms with said legs disposed in said open position thereof for disposition of items of food on said plate so that, when said plate is

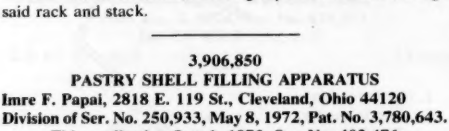
removed from said arms, said supporting structure can be pivoted into an essentially planar configuration.

3,906,849
ELECTRIC BROILER
Theodore M. Williams, 847 Daytona Ave., Holly Hill, Fla. 32017
Filed Sept. 27, 1974, Ser. No. 509,901
Int. Cl.[2] A47J *37/08*
U.S. Cl. 99—392 **3 Claims**



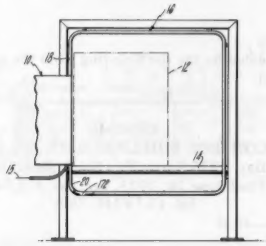
1. An electric broiler including a cabinet having a top wall, bottom wall, side walls, a rear wall and a front wall, said front wall having an access opening, a closure for said access opening, a food containing rack detachably mounted in said cabinet for movement through said access opening, said rack being formed of hingedly connected sections each having a foraminous side wall, food supporting elements mounted on at least one of said sections, electrical heating elements disposed in said cabinet between said side walls and the rack and having portions extending through and secured in said top wall, said portions having terminals disposed externally of the cabinet for connection to an electric current source, air inlet ports formed in bottom portions of the side walls and adjacent portions of the heating elements, food flavoring packets supported by the heating elements above and adjacent said air inlet ports for supplying food flavoring vapors to the air entering the cabinet for flavoring food contained in the rack, a stack opening through and extending upwardly from said top wall, an induction tube having a discharge end disposed in said stack and opening upwardly and an opposite inlet end projecting laterally from the stack, blower means discharging into said inlet end for extracting air and smoke from the cabinet, and damper means regulating the air inlet ports for regulating the rate of flow of the air, flavoring vapors and smoke through said rack and stack.

3,906,850
PASTRY SHELL FILLING APPARATUS
Imre F. Papai, 2818 E. 119 St., Cleveland, Ohio 44120
Division of Ser. No. 250,933, May 8, 1972, Pat. No. 3,780,643. This application Oct. 1, 1973, Ser. No. 402,476
Int. Cl.[2] A21C *9/08*
U.S. Cl. 99—450.7 **6 Claims**



1. Paste foodstuff dispensing means comprising in combination: (a) a paste dispensing head including a horizontally disposed dispensing chamber having a centrally located feed passage, discharge orifices extending through the bottom wall of the dispensing chamber, such orifices being conduits extending downwardly through the bottom wall of the dispensing chamber, the dispensing chamber being a chamber common to the orifices, the internal diameters of the conduits being progressively larger as the distance from the center of the head increases, the length of the conduits exceeding the vertical head space within the dispensing chamber above the conduits and said length being at least several times the internal diameters of the conduits; (b) a pump for feeding a predetermined amount of paste to said dispensing head; and (c) means for supplying paste foodstuff to said pump.

3,906,851
STRAPPING MACHINE
Robert P. Clark, Cheshire; Robert Lee Haven, Enfield, and Franz A. Kneidl, Milford, all of Conn., assignors to The Stanley Works, New Britain, Conn.
Division of Ser. No. 348,983, April 9, 1973. This application June 14, 1974, Ser. No. 479,223
Int. Cl.[2] B65B *13/32*
U.S. Cl. 100—4 **22 Claims**

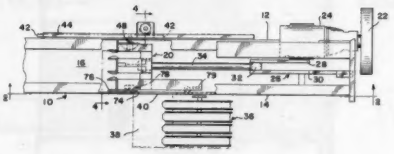


1. A strapping machine for binding an article with a length of generally flat strap to be joined together at its end at a sealing station to form a loop of strap and comprising strap guideway means for guiding strap into a loop about the article, a pair of strap shear members at the sealing station having opposed planar contact surfaces relatively slidable parallel to their plane of contact, the shear members including a fixed shear and a movable shear each having a free end defining an abutment face, the fixed shear having a strap guide opening formed adjacent its abutment face in alignment with the strap guideway means and forming a part thereof, a clamp member releasably engageable with a leading end portion of the strap looped about the article for clamping it against the abutment face of the fixed shear to condition the strap for sealing and shearing, the movable shear being reciprocable between a retracted starting position, wherein the strap guide opening of the fixed shear is exposed, and an extended position, the movable shear having a leading cutting edge at its free end along its juncture with its planar contact surface for shearing strap in the strap guide opening upon the movable shear being moved over the opening and into extended position.

3,906,852
HAY BALER KNIFE ADJUSTMENT
Edward L. Robinson, Jr., and Ralph E. Beyer, both of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.
Filed Nov. 27, 1974, Ser. No. 527,571
Int. Cl.[2] B30B *15/08*
U.S. Cl. 100—98 R **6 Claims**

1. In a hay baler having a bale chamber defined in part by a pair of opposite vertical sidewalls, a feed opening defined through one of the sidewalls by which hay is introduced into the bale chamber, an elongated knife disposed vertically on said one sidewall along an edge of said feed opening, a plunger

reciprocably mounted within the bale chamber for cyclically compressing hay therein received through the feed opening, an elongated knife mounted on the forward edge of the plunger so as to be moved therewith in close cutting relation to the knife on said one sidewall for cutting hay received through the feed opening, in combination with the improvement comprising:



an elongated rack connected to said plunger and reciprocably mounted on the outside of said bale chamber on the sidewall opposite to said one sidewall;

and means for vertically adjusting the position of said rack on said opposite sidewall to thus move said plunger-mounted knife relative to said sidewall-mounted knife to provide optimum cutting clearance therebetween.

3,906,853

ROLLER ARRANGEMENT IN PRESSES FOR THE REMOVAL OF WATER FROM MATERIALS

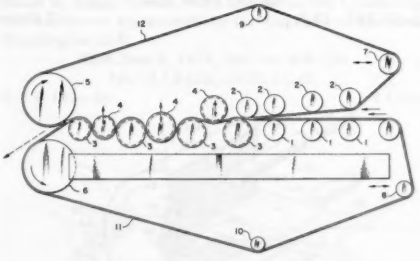
Alois Wohlfarter, Graz, Austria, assignor to Maschinenfabrik Andritz Aktiengesellschaft, Austria

Filed May 9, 1973, Ser. No. 358,598

Claims priority, application Austria, July 7, 1972, 5867/72

Int. Cl. B30b *9/24, 5/04*

U.S. Cl. 100—118 **2 Claims**



1. In a roller arrangement for removing water from fibrous material in which the material is fed between a pair of endless sieve bands which rotate in contact with each of upper and lower rollers,

the improvement comprising said upper and lower rollers each having a smaller diameter in the operating direction of the sieve bands than the preceding roller, and the vertical axial distances of the rollers also decrease in the operating direction.

3,906,854

PRINT HAMMER CONTROL MECHANISM

Yoshifumi Gomi, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

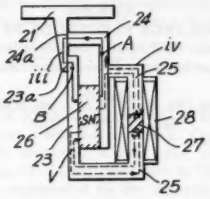
Filed Jan. 28, 1974, Ser. No. 437,253

Claims priority, application Japan, Jan. 26, 1973, 48-10807

Int. Cl.² B41J *9/30*

U.S. Cl. 101—93.34 **5 Claims**

1. In a printer, respective hammer control means for print hammers which are arranged in a plurality of columns and each of which is displaceable between a rest position and a print position, and having respective deformable elastic bodies maintained in deformed condition by the associated print hammers in the rest position, improved magnetic circuit control means comprising holding means for holding each said print hammer at said rest position, releasing means for selectively displacing said print hammer to said print position, and means for producing a magnetic flux, a first hammer hold magnetic circuit associated with each print hammer including a portion of the associated print hammer and a second control magnetic circuit associated with each print hammer including a control permanent magnet and control coil means, said



control coil means including means for applying a pulse thereto, said first magnetic circuit and second magnetic circuit being connected in parallel with said magnetic flux producing means, each of said magnetic circuit control means being adapted to hold said respective hammers in said rest position and to release said respective hammers upon application of a pulse to the control coil means by means of said signal applying means in a direction so as to reverse the polarity of said control permanent magnet and thereby decrease the magnetomotive force applied to said hammer, the energy stored in the respective deformed body displacing said respective hammer from said rest position to said print position upon said decrease in said magnetomotive force.

3,906,855

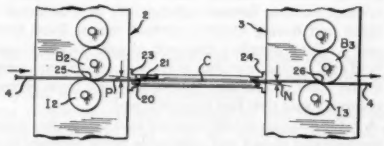
WEB TURNING BAR DEVICE

Oskar F. Laursen, Montreal, Canada, assignor to Wood Industries, Inc., Middlesex, N.J.

Continuation of Ser. No. 327,931, Jan. 30, 1973, abandoned. This application June 24, 1974, Ser. No. 482,150

Int. Cl.² B41F *1/08*

U.S. Cl. 101—223 **1 Claim**



1. In a web offset printing machine having first and second printing units spaced apart, and a web turning unit positioned between said printing units and along a horizontal line connecting the printing portions of each said printing unit adapted to turn and transfer a paper web extending between said printing portions where said turning unit has a first turning bar the longitudinal axis of which lies in a first plane and extends at approximately 45° to the direction of web travel between said printing units, a second turning bar positioned above said first bar with the longitudinal axis of said second bar lying in a second plane parallel to said first plane and at approximately 90° to said first plane, and a roller positioned to one side of said first and second bars with the longitudinal axis of the roller lying in a third plane midway between and parallel to said first and second planes and at approximately 45° to said first and second turning bars, the improvement comprising in

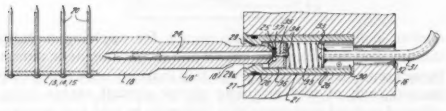
that said turning unit is inclined with respect to said horizontal line with the inclination of the planes containing the turning bars and roller forming a positive angle with respect to a portion of said horizontal line extending between the turning unit and said first printing unit and forming a negative angle with respect to the portion of said horizontal line extending between said turning unit and said second printing unit and where the angle of inclination does not exceed that whereby the turning bars would contact a straight lead of web extending directly from the printing portion of said first printing unit to the printing portion of said second printing unit.

3,906,856

HIGH VOLTAGE ELECTRODE MOUNTING

Thomas P. Bruno, Philipsburg, and Benedict F. Finn, Union, both of N.J., assignors to Wood Industries, Inc., Middlesex, N.J.

Filed Dec. 9, 1974, Ser. No. 530,868
Int. Cl.[2] B41F *31/00*
U.S. Cl. 101—349 **7 Claims**



1. An electrode having a body in a printing ink mist prevention system of a printing unit of a high-speed rotary printing machine, said unit having ink rollers and side frames supporting said electrode and said ink rollers, comprising:

A. First and fourth end members axially extending from both ends of said electrode, said end members formed substantially of a dielectric material, said end members having diameters, said electrode having plural electrically conductive emitters axially spaced therealong with each emitter extending outwardly from said electrode;

B. Said first end member having an axially extending bore disposed to receive an electrical conducting means for feeding electricity to said electrode,

C. A hollow socket member in one of said side frames having a third end member having a closed end, said socket formed substantially of a dielectric material; an axially slidable contact member in said socket; said contact member formed substantially of a dielectric material and having electric contact means fixed therein, and a spring member disposed in said socket biased to hold said contact member in place; a second end member in the other of said side frames having a front recess for receiving said first end member; and

D. A cable member axially inserted into said socket member through said closed end, said cable being disposed to feed electricity to said electric contact means in said contact member.

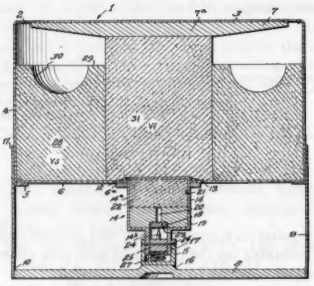
3,906,857

ANTI-TANK MINE

Salvatore Joseph Rotondi, Jr., 1112 N. Pitt St., Alexandria, Va. 22314

Filed May 22, 1953, Ser. No. 356,914
Int. Cl. F42b *23/04*
U.S. Cl. 102—8 **9 Claims**

1. In a demolition unit, a closed container, an explosive charge in said container, and a solid projectile plate of substantial thickness secured to the top wall of said container, said explosive charge comprising a center core portion in contact with said projectile plate for forming a shock wave when detonated to propel said projectile plate toward said target, and an annular portion concentric about said core and forming and annular shaped charge axially spaced rearwardly



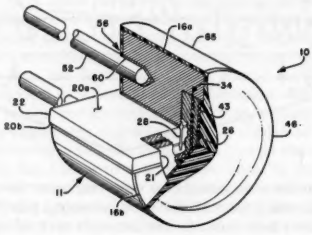
of said projectile plate and collapsible upon detonation to augment to the explosive effect of said center core portion.

3,906,858

MINIATURE IGNITER

James R. Craig, and Fred J. Villa, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Eneregy Research and Development Administration, Washington, D.C.

Filed July 30, 1974, Ser. No. 493,007
Int. Cl.[2] F42B *3/12*
U.S. Cl. 102—28 R **7 Claims**

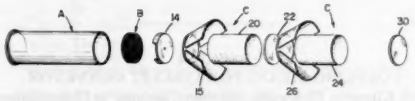


1. An igniter comprising a pair of electrically conductive spaced apart members each having a complementary recess extending inwardly from one end thereof, an electrically insulative ceramic plate intermediate said members maintaining them spaced apart having a recess extending inwardly from one end thereof corresponding with said member recesses and forming therewith an open-ended charge cavity, an electrically conductive bridgewire disposed at the bottom of said cavity spanning said insulative ceramic plate and having opposite end portions electrically connected with said spaced apart members, an igniter charge in said cavity in contact with said bridgewire, and a closure disc extending over said cavity and sealed to said electrically conductive members and said insulative plate.

3,906,859
PENETRATION RESISTANT PROJECTILE AND CARTRIDGE FOR CONVENTIONAL FIREARMS

Eugene C. Smith, Los Altos Hills, Calif., assignor to First Round Research, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 176,047, Aug. 30, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,893
Int. Cl. F42b *5/22, 9/20, 11/36*
U.S. Cl. 102—41 **9 Claims**

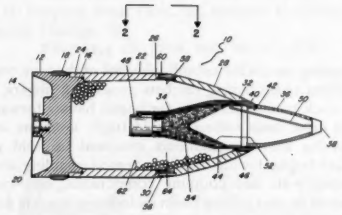


1. A cartridge for a weapon having a firing chamber and muzzle comprising: at least one plastic projectile of preselected weight having a coefficient of restitution less than 0.3, having a sectional density of less than 0.10 pounds per square inch, and having non-frangibility enabling impact of a hard surface at a velocity up to 400 feet per second at incident angles of up to 30° without breaking apart; a propellant charge for said projectile selected with respect to said preselected weight to provide energy per unit frontal area at said weapon muzzle no greater than 275 foot pounds per square inch and a minimum kinetic energy per projectile at said weapon muzzle of at least 35 foot pounds, wherein said plastic projectile has at least about 90 weight percent of a combination of blown vegetable oil in from 40 to 70 parts by weight and respectively 60 to 30 parts by weight of asbestos fiber.

3,906,860
DUAL PURPOSE PROJECTILE

William H. Johns, Verona, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,239
Int. Cl.[2] F42B *13/10, 13/48*
U.S. Cl. 102—56 **4 Claims**



1. A dual purpose projectile having both anti-materiel and anti-personnel capabilities comprising:

a base having a rear end and a threaded front end;

a hollow tubularly shaped body member having an internally threaded rear end and an internally threaded front end, the rear end of said body member threadedly attached to the front end of said base;

a hollow ogive member having an externally threaded rear end threadedly affixed to the front end of said body member, and a tapered internally threaded front end, the rear end of said ogive member having a plurality of radially positioned ogive discharge bores passing transversely through said ogive member, and a circumferentially positioned collar groove which communicates with said ogive discharge bores;

a plurality of orifice plugs releaseably positioned in said ogive discharge bores;

shaped charge assembly means attached to the front end of said ogive member for penetrating a materiel target upon impact of said projectile on said materiel target;

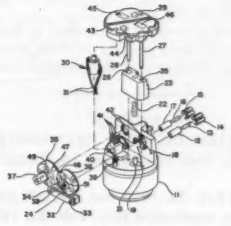
means for locking said plugs within said bores when said projectile is used in an anti-materiel mode, and for releasing said plugs during projectile spin when said projectile is used in an anti-personnel mode;

a plurality of balls contained within said body and ogive members intermediate said base and said shaped charge assembly means, said balls being capable of passing through the bores of said ogive member after said plugs have been ejected by the centrifugal force of said projectile spin when said projectile is in an anti-personnel mode.

3,906,861
FUZE STERILIZATION SYSTEM

C. Robert Hamilton, China Lake; John E. Crossley, Ridgecrest; Thomas W. Hampton, China Lake, and Kenneth N. Morris, Ontario, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1974, Ser. No. 435,047
Int. Cl. F42c *15/04*
U.S. Cl. 102—76 R **5 Claims**



1. An ordnance fuze in a projectile that arms said fuze when subjected to acceleration forces and which has a firing train, a safety and arming device comprising:

rotor means operatively arranged to interrupt said firing train when said fuze is in an unarmed condition and unbalanced about its rotation axis for rotating when said rotor is subjected to forces normal to its axis of rotation to complete said firing train when said fuze is in an armed condition;

rotation regulation means for allowing said rotator to move in one direction when subjected to acceleration forces until a predetermined angular rotation is obtained;

deceleration sensing means for initiating an electrical signal when the acceleration forces acting on said rotor decrease to a predetermined force; and

expandable means fixed adjacent said rotor means and electrically coupled to receive an electrical signal from said deceleration sensing menas for actuation of said expandable means to its enlarged mode;

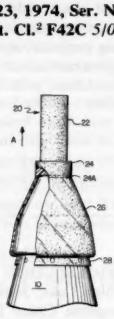
whereby the rotor means is allowed to rotate when subjected to acceleration forces and is rapidly locked from rotative movement whenever the acceleration forces acting on said rotor decrease to a predetermined force.

3,906,862

BUCKLING PROTECTIVE FUZE CAP

Thomas H. Zimmerman, Reston, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 23, 1974, Ser. No. 463,323
Int. Cl.[2] F42C 5/00
U.S. Cl. 102—81 11 Claims



1. In combination with a fluidic fuze for a detonating device contained in a projectile to be fired from a gun, said fuze having at least one port in the exterior surface thereof for the flow of fluids therethrough, cap means for sealing said at least one port before said projectile is fired, said cap means being removable in response to forces generated by the firing of said projectile, the improvement in said cap means comprising:

a. a flexible nose portion of a predetermined size extending from one end of said fluidic fuze; and

b. a flexible skirt portion extending in the opposite direction from said one end over said fuze in sealing engagement with said at least one port;

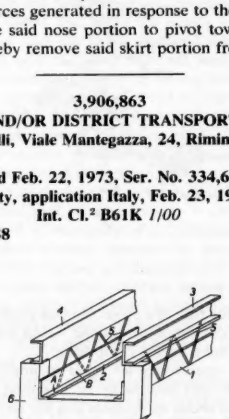
whereby the forces generated in response to the firing of said projectile cause said nose portion to pivot toward said skirt portion to thereby remove said skirt portion from said fuze.

3,906,863

CITY AND/OR DISTRICT TRANSPORT LINE

Riccardo Baldelli, Viale Mantegazza, 24, Rimini (Forli), Italy (47037)

Filed Feb. 22, 1973, Ser. No. 334,608
Claims priority, application Italy, Feb. 23, 1972, 20918/72
Int. Cl.[2] B61K 1/00
U.S. Cl. 104—88 17 Claims



1. A city and/or district transport line particularly for passengers, comprising:

a continuous travel track running without interruption between two terminal stations of the line;

at least one halt track associated with an intermediate station of the line;

at least one section of shunting track connecting each halt track to the travel track;

a car movable along the travel, halt, and shunting tracks;

first rolling means for the advancement of the car along the travel and halt tracks, said first rolling means being comprised of a first set of driven wheels rotatable about horizontal axes to support and advance the car; and

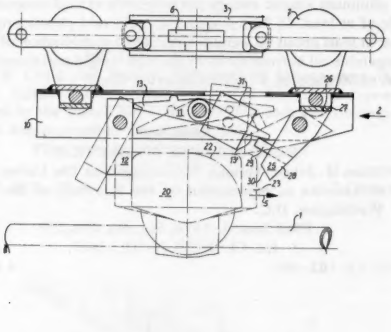
laterally projectable second rolling means for advancing the car along the shunting track to transfer the car between the travel track and the halt track, said second rolling means being comprised of a second set of wheels including a pair of front wheels and a pair of rear wheels each rotatable about a horizontal axis and laterally movable between a retracted, rest position not projecting substantially beyond the lateral profile of the car and an extended, working position in engagement with the shunting track.

3,906,864

COUPLING MEANS FOR CIRCUIT CONVEYOR

Erich Küwertz, Pirmasens, Germany, assignor to Pfalzstahlbau GmbH, Pirmasens, Germany

Filed Dec. 13, 1973, Ser. No. 424,377
Claims priority, application Germany, Dec. 13, 1972, 2260889; Oct. 3, 1973, 2349664
Int. Cl.[2] B61J 3/00
U.S. Cl. 104—88 5 Claims

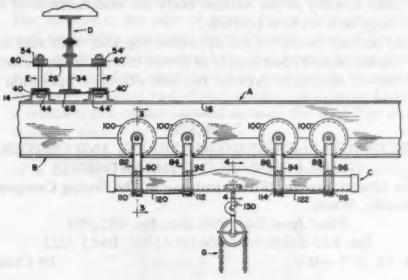


1. Coupling means for circuit conveyor of the type comprising a pulling chain having ratchets presenting fingers, a suspended track below said chain for bogies having forward and rearward drive units rolling on said track, coupling components having movable members mounted on said pulling chain, said bogies having fixedly mounted coupling elements cooperating with said coupling components, said coupling components on said pulling chain including a housing supporting a ratchet finger and a latch lever pivotally mounted on horizontal axes for pivotal movement in opposite directions, said latch lever normally retaining said ratchet finger in position for engagement, each rearward drive unit having a running path for cooperation with said ratchet finger to move said ratchet finger upwardly, one said bogy having a roller with a cap and said cap supporting a roller and having a forward curved portion defining said running path and a rearward vertical abutment surface, and a rearward roller having a cap having vertical forward and rearward surfaces, said ratchet lever serving also as a latch lever and presenting a nose adapted to stop said ratchet finger in vertical position above the axis of rotation thereof and when in raised position releases said ratchet lever, and the combination of said latch lever and said ratchet lever and finger further including a drop lever pivotally supported in said housing having a lower end adapted to cooperate with a roller cap and an abutment in said housing for engagement by an end of said drop lever.

3,906,865
MATERIAL HANDLING APPARATUS

Karl A. Pamer, Chagrin Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Continuation-in-part of Ser. Nos. 261,377, June 9, 1972, Pat. No. 3,809,382, and Ser. No. 261,529, June 9, 1972, Pat. No. 3,827,366. This application Jan. 11, 1974, Ser. No. 432,688
Int. Cl. B61b *3/00*
U.S. Cl. 104—89 **7 Claims**

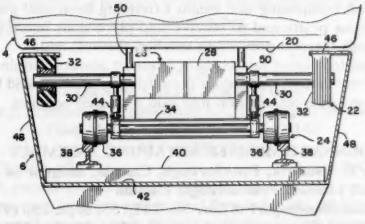


1. A trolley for a material handling system comprising: a load supporting member carried by a plurality of wheeled trucks each comprising a U-shaped frame member with wheels connected to the distal ends of the flange parts thereof and at least a part of said load supporting member extending between said flange parts and supported on the web parts of said frame members; a resilient, flexible closed vessel having fluid therein between said load supporting member and each of said web parts of said frame members subject to the entire weight of said load member and providing limited universal movement between said load and frame members; and a member connected to one of said load or frame members forming an abutment surface surrounding said resilient member limiting its expansion.

3,906,866
TRACTION POWER RAIL MODULE

Willis H. Knippel, Palos Park, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed May 23, 1974, Ser. No. 472,578
Int. Cl.² B61F *13/00*
U.S. Cl. 104—139 **3 Claims**

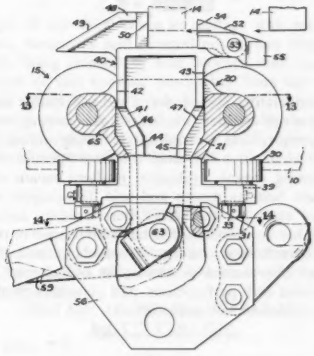


1. A combination of a guideway structure and a traction power module movable along said guideway structure,
said guideway structure comprising a floor and rail means mounted on said floor and a pair of transversely spaced overhead flanges spaced above said floor,
truck means supported on and depending from said module, said truck means including a truck platform having longitudinally spaced pairs of wheels supported on said rail means,
a traction device on said truck means including a power transmission and control means,
power driven shafts projecting outwardly from said power transmission and control means,
a traction wheel mounted on each of said shafts to be driven thereby,
each traction wheel being adaptable to engage said flanges in fractional driving relation,
pivotal link means supporting said traction device on said platform, and
fluid extendable means supported on said truck means for moving said link means to raise and lower said traction device and to exert a force varying the degree of frictional engagement at said traction wheels in driving engagement with said flanges.

3,906,867
POWER AND FREE CONVEYOR SYSTEM

Kenneth F. Knudsen, St. Clair Shores, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Continuation of Ser. No. 223,689, Feb. 4, 1972, abandoned. This application July 5, 1973, Ser. No. 376,623
Int. Cl.² B61B *13/00*
U.S. Cl. 104—172 S **10 Claims**



1. In a power and free conveyor system, the combination comprising
means defining a carrier track,
a carrier movable along said track,
said carrier comprising a plurality of trolleys,
power means extending along the path of the track,
said power means having carrier engaging means thereon, each said trolley comprising a one-piece trolley body,
each said trolley body having longitudinally spaced wheels thereon engaging said track,
said trolley bodies being substantially identical,
the leading trolley of the carrier having a pusher dog therein movable toward and away from the engaging means of the power track,
a pair of transversely spaced plates mounted on said body, actuating means mounted on said plates and connected to said pusher dog for moving said pusher dog out of the path of the carrier engaging means on the power means in response to engagement of said actuating means with an obstacle or a preceding carrier,
and means extending between the plates of adjacent trolleys pivotally interconnecting said trolleys,
said pusher dog comprising a part of a combined pusher dog and holdback dog assembly,
said combined pusher and holdback dog assembly comprising a pusher member having a rearwardly facing surface defining said pusher dog and a holdback dog pivoted to

said member and having a surface yieldingly urged upwardly in forwardly facing relation,

such that said pusher member and said holdback dog are moved out of the path of the carrier engaging means by engagement of the actuating means with an obstacle or a preceding carrier.

3,906,868

ARTICULATING SYSTEM FOR A CENTRAL BUFFER COUPLING

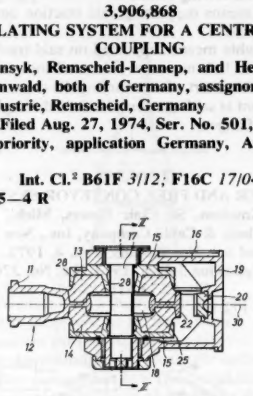
Klaus Ksiensyk, Remscheid-Lennep, and Henning Rocholl, Radevormwald, both of Germany, assignors to Bergische Stahl Industrie, Remscheid, Germany

Filed Aug. 27, 1974, Ser. No. 501,100

Claims priority, application Germany, Aug. 28, 1973, 2343246

Int. Cl.[2] B61F *3/12*; **F16C** *17/04*

U.S. Cl. 105—4 R **8 Claims**



1. An articulating system for a central buffer coupling, especially for rail vehicles, which includes: housing means for connection to a vehicle, a coupling rod having one end portion thereof provided with a dish-shaped widened portion arranged in said housing means, preloaded resilient means clamped between said housing means and said dish-shaped widened portion and clamping the latter therebetween, annular rib means peripherally connected to said dish-shaped portion and projecting therefrom in opposite directions in the axial direction of said dish-shaped portion, said dish-shaped portion being provided with perforations, and plate means of elastic material provided in said perforations.

3,906,869

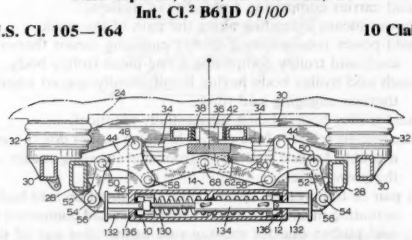
SAFETY DEVICE FOR BANKING VEHICLES

Richard N. Dobson, Creemore; John A. Gaiser, Beamsville, and Conrad D. Gris, Hamilton, all of Canada, assignors to Dominion Foundries and Steel, Limited, Hamilton, Canada

Filed Sept. 16, 1974, Ser. No. 506,384

Int. Cl.[2] B61D *01/00*

U.S. Cl. 105—164 **10 Claims**



1. A safety device for a banking vehicle, the vehicle comprising:

a frame;

at least two wheel and axle assemblies mounted by the frame and on which the vehicle runs;

a bolster member mounted to the frame and adapted to support a vehicle body thereon for pivoting and tilting movement relative to the frame;

link mounting means connecting the said bolster member and the frame for said tilting movement of the bolster member relative to the frame; and

first motor means connected between the link-connected members and operative upon supply of power thereto from a power source to produce the said tilting movement therebetween;

the safety device comprising:

a spring-urged device mounted by the frame and operative when effective to oppose tilting of the bolster member and thereby of the vehicle body for maintenance of the body in a vertical position,

and second motor means operative together with said first motor means upon supply of power thereto from the same power source to prevent the said effective operation of the spring-urged device.

3,906,870

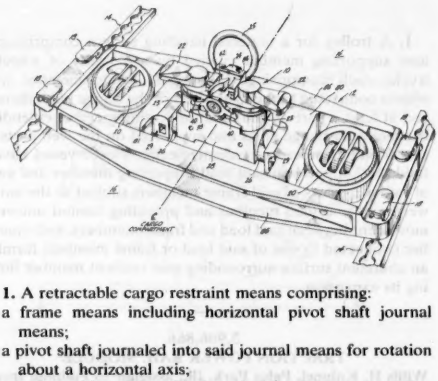
RETRACTABLE CARGO RESTRAINT AND CENTER GUIDE FOR CARGO COMPARTMENTS

John Alberti, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 24, 1974, Ser. No. 482,594

Int. Cl.[2] B60P *7/08*; **B61D** *45/00*; **B65J** *1/22*

U.S. Cl. 105—464 **19 Claims**



1. A retractable cargo restraint means comprising:

a frame means including horizontal pivot shaft journal means;

a pivot shaft journaled into said journal means for rotation about a horizontal axis;

a body positioned on said pivot shaft having cargoengaging lip elements extending outwardly therefrom;

means to lock said pivot shaft in a position wherein said rotatable body is erect with said cargo engaging lip elements exposed for engagement with securing pockets on cargo pallets or containers, said means to lock said pivot shaft comprising slot means extending from said journal means positioned to receive said pivot shaft and engage lands thereon preventing rotation thereof; and,

means to receive said body in a retract position within said frame means, said means permitting rotation of said body from an erect position into said retracted position.

3,906,871

DUNNAGE MEMBER RETAINING ASSEMBLY

Joseph D. Csumrik, Peterborough, Canada, assignor to Cargowall Limited, Peterborough, Canada

Continuation-in-part of Ser. No. 291,755, Sept. 25, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 464,993

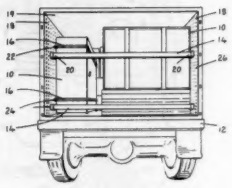
Int. Cl. B60p *7/08*

U.S. Cl. 105—475 **4 Claims**

1. A thin substantially flat rigid wall member adapted to be fixedly located in a predetermined planar position in a shipping container or vessel, the wall member having a plurality of similarly-shaped openings extending therethrough arranged in horizontal and vertical rows, the openings being equally spaced in said rows and adapted to inter-changeably removably receive the following bracket members for dunnage members:

a. a bracket member adapted to removably receive one end of a rigid dunnage bar with a uniform rectangular cross-section, the bracket member having a rigid box-like structure and a pair of hooks extending rearwardly therefrom the box-like structure formed by a pair of side walls connected by a rear wall and a floor to have an open top and open front, the box-like structure adapted for removable slidable insertion of the said one end of the dunnage bar through the open top into snug receipt in the box-like structure, in the assembled position, in which position the dunnage bar extends through the open front of the box-like structure, the pair of hooks being vertically spaced and projecting rearward from the rear face of the rear wall of the box-like structure, the hooks being downwardly curved and adapted to be engageably received in vertically adjacent two of the openings at a desired height a selected one of the vertical rows of the openings in the wall member,

b. a single hook member adapted to be secured to one end of a dunnage strap, the single hook member having a



hook adapted to be inserted through a selected one of the openings in the wall member to the assembled position in which it partially protrudes from an adjacent horizontal or vertical opening to securely engage a portion of the wall member extending between the said selected opening and the said adjacent opening and an aperture in the bracket member adapted to securely attachably receive the said one end of the dunnage strap,

c. a double hook member adapted to be secured to one end of a dunnage rope, the double hook member having a pair of arms extending in a spaced relationship from an eye adapted to securely attachably receive the said one end of the dunnage rope, the arms each having a tip portion bent in opposite directions to extend substantially perpendicularly to the respective arms, the arms being spring loaded whereby they may be manually compressed together, their tip portions inserted through a selected one of the openings in the wall member and then released to the assembled position wherein the double hook member securely engages the wall member.

3,906,872

CORNER SHELF STRUCTURE

Alfred J. Erickson, 624 Brookway Ln., Las Vegas, Nev. 89109

Filed Mar. 1, 1974, Ser. No. 447,145

Int. Cl.² A47B *57/00*

U.S. Cl. 108—92 **8 Claims**

1. A corner shelf structure comprising

a rear post and first and second forward posts, all interconnected at upper ends thereof to form a skeletal pyramidal structure,

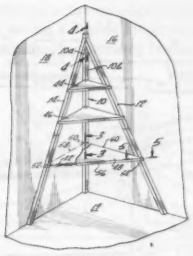
a forward shelf support comprising a substantially horizontally extending support member connected at opposite ends thereof to said first and second forward posts,

a substantially horizontal shelf having a rear corner, and first and second forward corners, having first and second side edges extending from the rear post to the first and second forward posts respectively, and having a forward edge extending substantially between said first and second forward posts, and

means for connecting said rear corner to said rear post,

said shelf being free of connection with said forward shelf support and being free of connection with said first and second forward posts but having a forward portion resting upon said shelf support,

said forward edge extending forwardly of said shelf support and said forward corners extending forwardly of said first and second forward posts respectively, and said side



edges of the shelf being in contact with said forward posts, motion of said forward posts away from one another being resisted by said forward shelf support and motion of said forward posts away from said rear post being resisted by the forward shelf corners, whereby the forward posts are locked in position by the collective restraints exerted by the forward shelf support and the forward corners of the shelf.

3,906,873

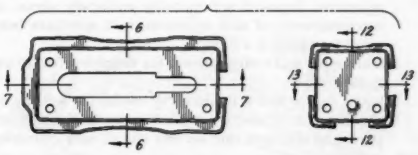
WASTE CONVERTER

Harry W. Green, Marine City, Mich., and Ormand F. Cook, Port Clinton, Ohio, assignors to The Standard Products Co., Cleveland, Ohio

Filed Apr. 19, 1974, Ser. No. 462,350

Int. Cl.² F23G *5/12*

U.S. Cl. 110—7 S **4 Claims**



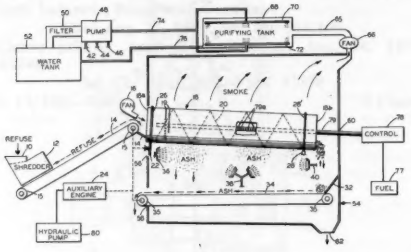
1. Sewage disposal means comprising a vaporizing chamber, means for discharging downwardly into the chamber flaming products of combustion at a rate sufficient to maintain the chamber in a flame-filled condition, means for feeding sewage products into the chamber slowly enough so that the chamber remains substantially flame-filled, whereby a high proportion of such sewage products are vaporized and consumed therein, exhaust means connected to an upper portion of said chamber, and separating means in the exhaust means for removing solids from the exhaust.

3,906,874

MOBILE FURNACE VEHICLE

John C. Jaronko, and John T. Jaronko, both of New Britain, Conn., assignors to Nutmeg Sanitation, Inc., New Britain, Conn.

Filed Aug. 30, 1973, Ser. No. 393,021
Int. Cl.[2] F23B *1/32*; F23G *5/06*
U.S. Cl. 110—14 7 Claims



1. A mobile apparatus for collecting and burning refuse comprising:

a chassis having wheels for movement between collection and disposal points and having thereon the following structures:

a hopper disposed on said chassis for receiving refuse;

a shredder communicating with said hopper for reducing the size of the refuse received by said hopper to particles suitable for burning;

a first transfer means for receiving refuse conditioned by said shredder;

a cylindrical member having a perforate skin for allowing passage of ash therethrough and having first and second ends, said first end communicating with said first transfer means for receiving said refuse;

means for urging at least some of said refuse through said cylindrical member to said second end;

a fan communicating with said cylindrical member for supplying air to the interior of said cylindrical member;

a hollow tube disposed generally co-axially with respect to said cylindrical member and having a plurality of apertures disposed substantially uniformly about the circumference of said apertures, said apertures being sized for burning a fuel;

a fuel supply and control means for supplying fuel to said hollow tube;

a liquid supply and a liquid spray means for wetting ash passing out of said cylindrical member through said perforate skin and said second end of said cylindrical member;

second transfer means for moving ash from said cylindrical member;

an ash receiving means disposed in communication with said second transfer means;

a substantially closed housing mounted on said chassis and enclosing said cylindrical member, liquid spary means, second transfer means and at least a portion of said hollow tube;

a second fan in fluid communication with said substantially closed housing urging smoke from the area of said substantially closed housing; and

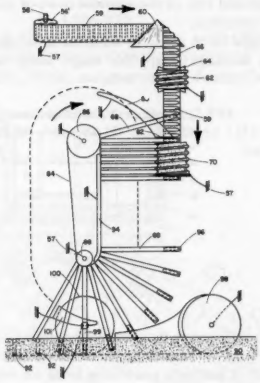
a purifying tank for washing the smoke conducted by said second fan and in fluid communication with said fan.

3,906,875

TRANSPLANT HANDLING MEANS

Donald A. Kesinger, Denver, and Leland S. Inscho, Jr., Evergreen, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 318,952, Dec. 27, 1972, which is a continuation-in-part of Ser. No. 102,582, Dec. 30, 1970, Pat. No. 3,772,137. This application July 10, 1974, Ser. No. 485,393
Int. Cl.[2] A01C *11/02*
U.S. Cl. 111—2 7 Claims



1. A process for the automated transplanting of a continuous transplant carrier into individual capsules containing transplants, comprising the steps of:

forming a continuous transplant carrier tape provided with spaced capsules each of sufficient size to accommodate the germinated seed or plant and media to support growth and provided with aperture means for the exchange of moisture and gases to support such growth;

said tape formed by providing a continuous length of flexible backing, corrugating a continuous length of plastic sheet to form corrugations including alternate valley portions, attaching said valley portions to the flexible backing to thereby define said spaced capsules, and perforating said capsules to provide for the exchange of moisture and gases;

inserting seed and support media within the capsules;

winding said tape into a roll provided with means for preventing unrolling of the roll;

germinating and preculturing the seeds in said capsules for a period of time well beyond the time when radical and cotyledon emerge from the seeds to produce such transplants;

mounting said roll of carrier tape with transplants contained in said individual capsules onto a transplanting mechanism so that the capsules are oriented substantially vertically;

unrolling said roll and reorienting the capsules into a substantially horizontal attitude;

grasping said capsules individually and severing individual capsules one from another and thereafter synchronously reorienting the thus severed capsules into a vertical position with the transplants upright; and thereafter

planting the capsules together with included upright transplants in spaced relationship.

3,906,876

DRIVE FOR YARN FEED ROLL ASSEMBLY

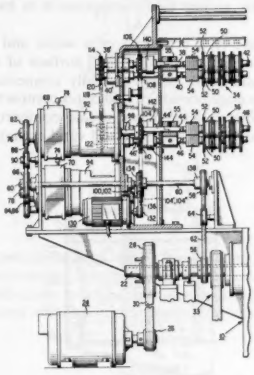
Nigel S. Fitton, Great Harwood, England, assignor to The Singer Company, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,770

Claims priority, application United Kingdom, Aug. 31, 1974, 38139/74

Int. Cl.[2] D05C *15/32*

U.S. Cl. 112—79 A 5 Claims



1. A variable speed drive for a tufting machine pattern attachment having a plurality of yarn feed roll drive shafts with certain of the shafts adapted to be rotatable at different speeds, said drive comprising a main motor, a speed regulating unit for each different feed roll drive shaft speed, each regulating unit having an input shaft and an output shaft and means for varying the speed of the output shaft relative to the input shaft only while the unit is driven, a first drive transmitting means between the main motor and the input shaft of each regulating unit to drive the regulating units in a first direction, a second drive transmitting means between the output shaft of each regulating unit and corresponding feed roll drive shafts, said second drive transmitting means including means operative to effect a drive coupling only when the regulating units are driven in said first direction, and auxiliary motor operative only when a feed roll drive shaft speed variation is to be effected, and a third drive transmitting means between the auxiliary motor and the input shaft of each regulating unit to drive the regulating units in a reverse direction to said first direction.

3,906,877

REINFORCED HEM FORMING DEVICE

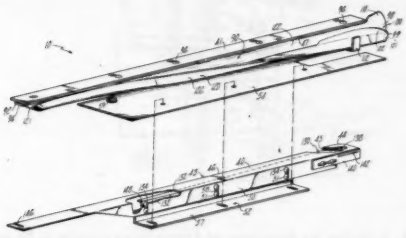
John L. Rockerath, and Harold J. Schreck, both of Utica, N.Y., assignors to Jetsew, Inc., Barneveld, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,492

Int. Cl.[2] D05B *35/02*

U.S. Cl. 112—141 8 Claims

1. A reinforced hem forming device for use in a sewing machine installation for automatically forming a reinforced hem, along a lateral edge of a material blank as the blank is conveyed longitudinally forwardly through the forming device, having a front hem face, an elongated reinforcing ribbon underlying the front face, and an outer lateral inwardly folded edge section having a back hem face underlying the reinforcing ribbon and a tucked edge portion intermediate the front and back hem faces, the reinforced hem forming device comprising a longitudinally extending inner face member having an upper inner face for receiving a front hem face portion of a material blank as the material blank is conveyed longitudinally forwardly through the forming device and an outer longitudinally extending fold edge for folding an outer lateral edge section of the material blank inwardly therearound to underlie the front hem face portion of the material blank to form a back hem face portion, a longitudinally extending ribbon guide underlying the inner face member providing a longitudinally extending ribbon channel therebelow for conveying a reinforcing ribbon longitudinally forwardly beneath the front hem face portion of the material blank, and a folder extending longitudinally forwardly generally below the inner face member and ribbon guide and defining a material receiving guide trough for receiving the outer lateral edge section of the material blank, the folder having a double longitudinally extending twist with a first longitudinally extending twist section twisting



forwardly in a clockwise direction to define a first longitudinally extending guide trough section for folding the outer lateral edge section of the material blank inwardly around said fold edge of the inner face member and a second longitudinally extending twist section twisting in the clockwise direction to define a second longitudinally extending guide trough section for folding a tucked edge portion of the outer lateral edge section of the material blank to overly the back hem face portion of the material blank, the folder having a forward exit end adjacent the inner face member to provide that a hem formed on a material blank by the hem forming device exits from the forming device in a fully preformed condition with the reinforcing ribbon between the front and back hem faces thereof.

3,906,878

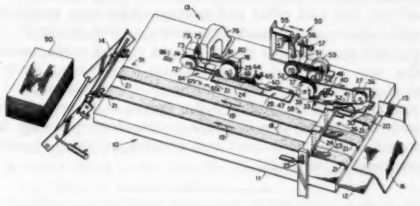
HEMMING METHOD AND APPARATUS

Perry E. Burton, P.O. Box 68, Fountain Inn, S.C. 29644

Filed Feb. 15, 1974, Ser. No. 442,733

Int. Cl.[2] B32B *7/08*

U.S. Cl. 112—423 18 Claims



18. A sheet of cloth or the like including at least one double folded hem manufactured by a process which includes the step of moving the sheet of cloth along a path with the edge portion to be hemmed extending approximately parallel to the path, forming a first fold in the edge portion and folding the first fold over on itself to form a double fold as the sheet of cloth moves along the path, retarding the movement of the leading portion of the first fold with respect to the body of the sheet of cloth and advancing the movement of the subsequent por-

tion of the first fold with respect to the body of the sheet of cloth.

3,906,879

MARINE VESSEL HAVING DEVELOPMENT AND RECOVERY DEVICE

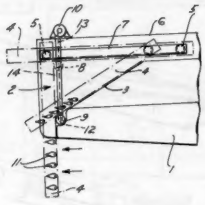
Wilhelm Lucht, Nordenham, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany

Filed Nov. 5, 1973, Ser. No. 413,076

Claims priority, application Germany, Nov. 11, 1972, 2255438

Int. Cl.[2] B63B *35/44*

U.S. Cl. 114—43.5 **3 Claims**



1. A device for deploying and recovering objects to be used in a marine vessel having a hull and a deck and an elongated cut-out in the hull and the deck comprising, in combination, an elongated load-moving device having two longitudinally spaced end portions; means for mounting said load-moving device in said cut-out for movement longitudinally thereof and for pivoting relative thereto between a first end position in which said load-moving device extends longitudinally of said cut-out and substantially horizontally so that the objects can be placed on said load-moving device and removed therefrom, and a second end position in which said load-moving device extends substantially vertically and into the body of water on which the vessel floats so that the objects can be deployed and recovered, said mounting means including first guide means extending substantially horizontally and longitudinally of said cut-out, first roller means pivoted on one of said end portions of said load-moving device and engaging said first guide means, second roller means extending substantially horizontally and transversely of said cutout at the other end portion of said load-moving device when the latter is in said first end position and supporting the same, and second guide means for guiding said second roller means in a substantially vertical direction; and first drive means for moving said first roller means in said first guide means so that said one end portion of said load-moving device is displaced longitudinally of said cut-out and said other end portion slides over said second roller means, and second drive means for independently moving said second roller means in said second guide means so that said other end portion of said load-moving device is displaced in said vertical direction and said load-moving device pivots about said first roller means as it moves between said first end position in which it extends substantially horizontally, and said second end position in which it extends substantially vertically.

3,906,880

OIL RECOVERY APPARATUS FOR A TANKER

Floyd E. Hebert, 7748 52nd South, Seattle, Wash. 98118

Filed Dec. 19, 1974, Ser. No. 534,457

Int. Cl.[2] B63B *25/08, 43/10*

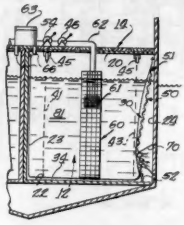
U.S. Cl. 114—74 R **4 Claims**

1. Oil recovery apparatus for a tanker ship having a multitude of independent crude oil carrying tank compartments, each tank compartment having a top surface, a bottom surface, an inner wall surface, an outer wall surface adjacent the ship hull, a front wall surface, and a back wall surface, each of said compartments disposed beneath the tanker deck, said recovery apparatus comprising, in combination:

a container manufactured of a strong flexible vinyl material having its top edges secured to portions of said compartment side walls adjacent the top surface thereof, said container being of a size and configuration adapted to substantially fill said compartment to line said wall and said bottom surfaces thereof;

means operatively connected to said vinyl container for retaining the same in a storage position adjacent the top surface of said compartment, and releasable to permit said container to line said compartment in its operable position;

a wire mesh net type screening of a width and length to completely overlie said outer wall surface of said compartment, said mesh being hingedly connected at one edge to a top edge portion of said outer compartment wall with said mesh extending across said compartment in a position immediately beneath said vinyl container;



means releasably securing said mesh in its storage position extending across said compartment, said means operable to release said mesh to swing about its hinged edge to drop into said compartment and completely overlies said compartment outer wall surface;

a motorized transfer pump mounted on said tanker ship's deck and having an inlet port and an outlet port;

means connecting said transfer pump inlet port to a position interiorly of said compartment;

means connecting said transfer pump outlet port to a position inwardly of said vinyl container; and

whereby operation of said transfer pump after release of said wire mesh net and said vinyl container into their operable position effects transference of the crude oil from said tanker compartment into said vinyl container which lines said compartment with said wire mesh net overlying said compartment outer wall surface to protect said vinyl container from jagged edges of a ruptured outer wall.

3,906,881

SELF STEERING GEAR FOR YACHTS AND BOATS

Knut Emil von Trepka, Heimlibakken 2c, Oslo 2, Norway

Filed Oct. 12, 1973, Ser. No. 405,987

Claims priority, application Norway, Oct. 12, 1972, 3663/72

Int. Cl.[2] B63H *25/52*

U.S. Cl. 114—144 C **4 Claims**

1. A self steering mechanism for marine craft wherein said craft has a hull and rudder, comprising:

a. a wind actuated steering vane;

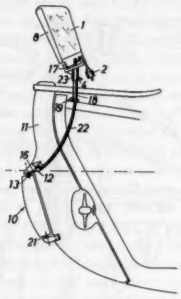
b. pivot means supporting said vane to the hull of the craft, said pivot means forming an acute angle with the horizontal and turnable about a vertical axis;

c. means comprising a counterweight to balance said vane on said pivot means;

d. an auxiliary rudder operably mounted on the rudder of said craft for rotation about an axis parallel to the axis of rotation of said rudder;

e. a flexible cable disposed betweeen said vane and said auxiliary rudder and means connecting one end of said

cable to the vane and the other end of said cable to the auxiliary rudder;



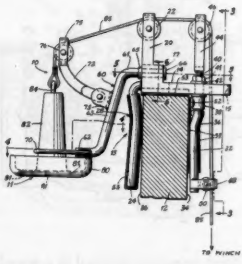
f. first means to lock said vane to said pivot means and second means interposed between said vane and said flexible cable to allow the rotation of said vane locked to the pivot means without rotation or twisting of the cable.

3,906,882

ANCHOR MOUNT ASSEMBLY

Harold Mayfield, 2840 Fortune Dr., Granite City, Ill. 62040

Filed Dec. 14, 1973, Ser. No. 424,668
Int. Cl.² B63B 21/22
U.S. Cl. 114—210 **12 Claims**



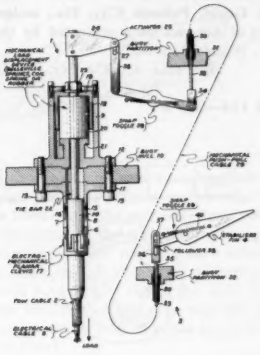
1. An anchor mount assembly for mounting an anchor to a boat and operating said anchor between stored and lowered positions, the assembly comprising arm means extending generally outwardly from the boat and downwardly toward the water, said arm means having an upper portion extending in said outward direction from the boat and defining a pivotal axis for said arm means, said axis extending in the same outward direction as said arm means, means for pivotally mounting the arm means at its upper portion to the boat for pivotal movement about said axis, and guide means for receiving a line, one end of which is attached to the anchor, said guide means including at least one guide mounted for movement with said arm means, said pivotal movement being sufficiently free with the anchor in the water so as to allow pivotal movement of said arm means in response to a component of tension force in said anchor line acting to produce a moment about said pivotal axis.

3,906,883

STABILIZER FIN CONTROL SYSTEM FOR A TOWED BUOY

Charles Peter Majkrzak, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 22, 1974, Ser. No. 441,692
Int. Cl.² B63B 21/56
U.S. Cl. 114—235 B **9 Claims**



1. A stabilizer fin control system for a towed hollow buoy comprising:

a tow cable for said buoy;

a stabilizer fin for said buoy;

a first mechanical means disposed at said buoy coupled to said cable, said first means being mechanically displaced proportional to tensile loading of said cable; and

a second mechanical means interconnected between said stabilizer fin and said first means, said second means being responsive to the mechanical displacement of said first means to control said stabilizer fin to assume a low-lift attitude when said tensile loading exceeds a first given amount and to assume a normal lift attitude when said tensile loading is less than a second given amount, said first given amount being greater than said second given amount;

said first means including

a hollow cylindrical member having a longitudinal axis and a pair of elongated slots parallel to said axis and diametrically opposite each other, said cylindrical member being connected to the outer surface of said buoy adjacent a tow point,

a cylindrical element disposed within said cylindrical member coaxial of said axis in a longitudinal sliding relation with said cylindrical member, said cylindrical element having a pair of projections adjacent one end thereof diametrically opposite each other, each of said pair of projections slideably engaging a different one of said pair of slots,

a planar clevis connecting the other end of said cylindrical element to said cable,

a cylindrical housing connected to the inner surface of said buoy disposed coaxial to an extension of said axis, an inverted cup-shaped member slideably disposed in said housing coaxial of said extension of said axis,

a mechanical load displacement device disposed within said inverted cup-shaped member between the bottom thereof and the inner surface of said buoy,

a bar connected to said one end of said cylindrical element extending through a wall of said buoy, through said load displacement device and beyond the bottom of said inverted cup-shaped member coaxial of said axis

and said extension of said axis, said bar being secured to the bottom of said cup-shaped member,

an arm connected to said bar adjacent the end thereof that extends beyond the bottom of said inverted cup-shaped member, and

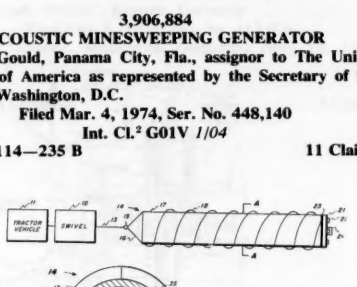
an actuator carried by said arm to control said second means.

3,906,884

ACOUSTIC MINESWEEPING GENERATOR

Paul F. Gould, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 4, 1974, Ser. No. 448,140
Int. Cl.[2] G01V *1/04*
U.S. Cl. 114—235 B **11 Claims**



1. An underwater minesweeping system, comprising in combination:

an open-ended elongated pipe having a longitudinal axis;

a nose cap of predetermined geometrical configuration connected to one of the open ends of said elongated pipe in such manner as to effect the closure thereof;

another cap of predetermined geometrical configuration connected to the other of the open ends of said pipe in such manner as to effect the enclosure thereof;

a fin having edges along the length thereof and a predetermined width therebetween, with one of said edges thereof connected to the outer surface of the aforesaid elongated pipe in such manner as to make said fin form a substantially helical configuration around and along the length of said elongated pipe and extend outwardly therefrom, whereby said fin has such angle of attack with respect to water ambient thereto and to said elongated pipe as to effect the rotation of said elongated pipe about its longitudinal axis whenever it is propelled along an underwater course;

means effectively connected to one of the aforesaid end closure caps of said elongated pipe for effecting the propelling thereof along said underwater course with the longitudinal axis thereof substantially parallel thereto; and

means disposed within said end-capped elongated pipe for banging against the internal surface thereof in response to the rotation thereof about the longitudinal axis thereof as a result of the propelling thereof along said underwater course by the aforesaid propelling means.

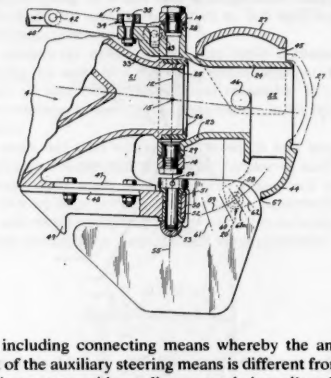
3,906,885

MARINE JET DRIVE WITH POWER TRIM CONTROL AND AUXILIARY RUDDER STEERING

William L. Woodfill, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 30, 1973, Ser. No. 420,620
Int. Cl.[2] B63H *11/10*
U.S. Cl. 115—12 R **27 Claims**

1. A marine jet propulsion drive apparatus including a drive jet means for creating a jet for effecting propulsion of a vessel, comprising a main steering control means coupled to the drive jet means for lateral deflection of said jet means for steering purposes, trim means coupled to the drive jet means for generally vertical deflection of said jet means, an auxiliary steering means movable to assist the main steering control means, and a coupling means interconnecting the auxiliary steering means to the main steering control means for related angular move-



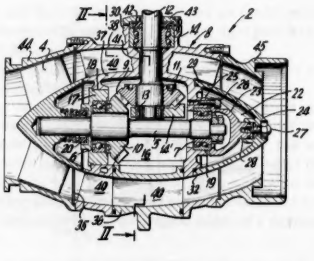
ment and including connecting means whereby the angular movement of the auxiliary steering means is different from the main steering means, said coupling means being adjustable to selectively change the angular movement of the auxiliary steering means for a given angular movement of the steering control means with the adjustment of the trim means.

3,906,886

WATER JET FOR A SPEED BOAT

Gerd Elger, Winterthur, Switzerland, assignor to Allianz-Technik AG, Basel, Switzerland

Filed Jan. 14, 1974, Ser. No. 433,293
Int. Cl.[2] B63H *11/02*
U.S. Cl. 115—16 **2 Claims**



1. A water jet drive mounted inboard in a speed boat which has a water inlet in the bottom of the boat and a jet nozzle outlet in the stern of the boat, comprising a stator housing positioned in the boat and forming an annular flow passage and having an inlet end connected to the water inlet into the boat and an outlet end connected to the jet nozzle outlet from the boat, a drive shaft arranged to be driven by a motor mounted in the boat and said drive shaft extending into said stator housing, a driving bevel gear mounted on said drive shaft within said stator housing, an impeller shaft mounted in said stator housing and extending in the direction of flow between the inlet end and the outlet end of said stator housing, a driver bevel gear positioned on said impeller shaft and arranged to be driven by said driving bevel gear, wherein the improvement comprises first bearing means provided within said stator housing for rotatably supporting said impeller shaft and second bearing means provided within said stator housing for rotatably supporting said drive shaft, said first bearing means comprises a pair of spaced first bearing members mounted on said impeller shaft, each on an opposite side of

said driver bevel gear, and said second bearing means comprises a pair of second bearing members mounted on said drive shaft, each on an opposite side of said driving bevel gear, said stator housing comprises an annular-shaped inner shell and an annular-shaped outer shell encircling and spaced outwardly from said inner shell, said inner and outer shells defining therebetween an annular flow passage through said stator housing, said inner shell having a first end directed toward the inlet end of said stator housing, and a second end directed toward the outlet end of said stator housing, said impeller shaft extending through the first end of said inner shell, an impeller mounted on said impeller shaft between the inlet end of said stator housing and the first end of said inner shell, a bearing flange mounted in the first end of said inner shell, one of said first bearing members supported in said bearing flange, the other one of said first bearing members supported directly in the second end of said inner shell, a two-part bell-like member attached to the second end of said inner shell and forming a closure over the second end of said inner shell, said two-part bell-like member comprises an inner bell dome attached to the second end of said inner shell and projecting therefrom toward the outlet end of said inner housing, said inner bell dome having a centrally positioned extension extending toward the outlet end of said stator housing, and an outer bell dome concentrically arranged about said inner bell dome and detachably secured to said centrally positioned extension on said inner bell dome.

3,906,887

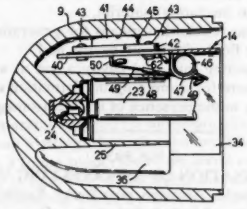
ELECTRIC OUTBOARD MOTOR

Chris S. Kappas, 218 13th St., Racine, Wis. 53403

Filed Mar. 29, 1974, Ser. No. 456,247

Int. Cl.² B63H *21/26*

U.S. Cl. 115—18 E **11 Claims**



1. An electric outboard motor having a lower submergible propeller unit, comprising a drive motor, a lower propeller drive housing enclosing said motor and having a control housing section with an access opening and having an outer wall portion, a motor control bracket, a multiple element motor control circuit including a solid state switch and interrelated control elements mounted on said bracket, releasable mounting means connected to the control housing section and to the bracket, said bracket including a mounting portion releasably clamped within the housing section and having a flat cantilevered plate extending therefrom, said solid state switch being mounted to the back side of said plate and bending said plate relative to the channel portion with the switch engaging the wall portion.

3,906,888

WATER-BORNE CRAFT WITH ROTATABLE FLOAT BODIES

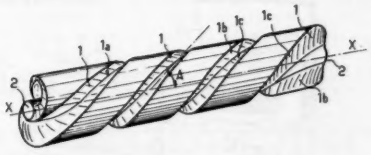
Marcel Justinien, 20 bis rue Jouvenent, 75016 Paris, France

Filed May 14, 1974, Ser. No. 469,843

Claims priority, application France, May 18, 1973, 73.18812

Int. Cl.² B63H *1/12*

U.S. Cl. 115—19 **9 Claims**



1. A water craft having at least one rotatable float body of a general cylindrical form and defined by a helical winding extending from the front end to the rear end of said body, with the helicoidal development of the winding beginning at said front end and terminating at said rear end at or substantially at the full diameter of the body in a plane substantially perpendicular to the general longitudinal axis of the body, the adjacent portions of the winding defining a passage the depth of which diminishes progressively over its entire length from said front end to said rear end.

3,906,889

CRYSTAL GROWING APPARATUS

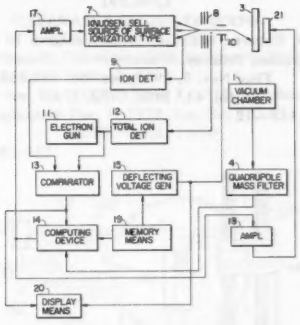
Itiro Omura, Hino, and Tadao Kaneko, Oome, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 22, 1973, Ser. No. 325,740

Claims priority, application Japan, Jan. 21, 1972, 47-7612

Int. Cl.² C23C *13/12*

U.S. Cl. 118—5 **19 Claims**



6. A crystal growing apparatus comprising:

a vacuum chamber within which a crystal substrate to be grown may be disposed;

first means for irradiating a crystal substrate disposed within said chamber with particles of opposite charge by at least one ion beam;

second means, coupled to said first means, for detecting the magnitude of said at least one ion beam;

third means, coupled to said chamber, for detecting the ratio of the partial pressures of molecules within said chamber; and

fourth means, coupled to said second and third means, for controlling the irradiation of said at least one ion beam by said first means in accordance with the outputs of said second and third means, whereby a resulting neutralized particle is grown upon the surface of said substrate.

3,906,890
BLOOD SMEARED SLIDE CENTRIFUGE

Lynn G. Amos, Raleigh, N.C.; James W. Bacus, Hinsdale, Ill.; Robert C. Beaty, and Charles H. Rogers, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

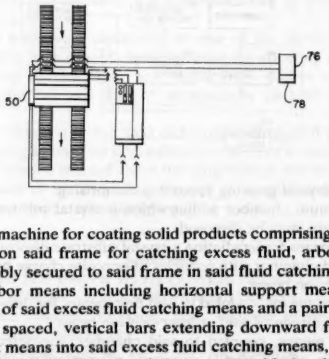
Filed May 24, 1973, Ser. No. 363,433
Int. Cl.² B04B 9/10; G01N 1/28; G02B 21/34
U.S. Cl. 118—6 11 Claims

1. Apparatus for preparing blood films on a microscope slide comprising:
- a centrifuge for spinning said slide with a surface of said slide perpendicular to the spin axis of said centrifuge,
- a drive circuit for said centrifuge for controlling the time integral of the centrifugal force applied to the slide by said centrifuge,
- a manually-adjustable variable control for said drive circuit for adjusting said time integral, and
- a scale having indicia corresponding to red blood cell concentration and associated with said variable control for indicating the desired setting thereof as a function of red blood cell concentration.

3,906,891
WOOD STAINING APPARATUS

Frank D. Roberts, Bellevue, Wash., assignor to Cedar Falls Corporation, Bellevue, Wash.

Filed Nov. 5, 1973, Ser. No. 412,833
Int. Cl.² B05C 1/02, 11/02
U.S. Cl. 118—12 12 Claims

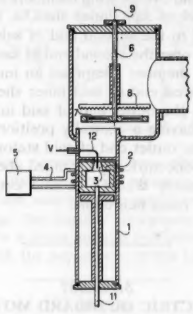


1. A machine for coating solid products comprising a frame, means on said frame for catching excess fluid, arbor means removably secured to said frame in said fluid catching means, said arbor means including horizontal support means lying outside of said excess fluid catching means and a pair of transversely spaced, vertical bars extending downward from said support means into said excess fluid catching means, a pair of rotatable drive rolls and at least one rotatable brush secured to said vertical bars, means for rotating said brush and at least one of said rolls, means for applying coating fluid to said product as it is passed through said rolls and brush, said arbor including a quick release coupling for securing the arbor horizontal support means to said frame whereby the entire set of drive rolls and brush can be removed as an integral unit and wherein the horizontal support means remians out of and thus free of fluid to reduce cleaning time.

3,906,892
PLASMA DEPOSITION OF THIN LAYERS OF SUBSTRATED OR THE LIKE

Jean L. Van Cakenberghe, Mons, Belgium, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Division of Ser. No. 246,019, April 20, 1972, Pat. No. 3,801,355. This application Nov. 21, 1973, Ser. No. 417,842
Claims priority, application Belgium, Apr. 27, 1971, 766345
Int. Cl.² C23C 13/12
U.S. Cl. 118—49.1 5 Claims

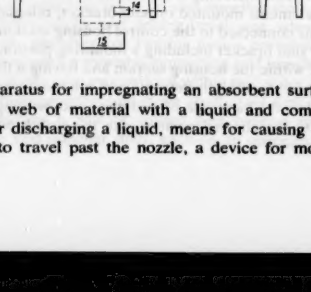


1. A plasma deposition device comprising:
- a vacuum container formed of an insulating material,
- means for maintaining said container at high vacuum,
- a substrate support within said container,
- a substrate carried thereby,
- means defining a cavity lined on its inside with the substance to be deposited and having an opening therein adjacent to the substrate, the wall of said cavity being formed of an insulating material,
- a high-frequency excitation means for generating an electromagnetic field within said cavity, and
- means for injecting into said cavity a gas at a pre-determined pressure for promoting the formation of a plasma in the cavity in the presence of the electromagnetic field.

3,906,893
IMPREGNATION OF A TRAVELLING WEB

Julian Thomas Scales, Alvaston, near Derby, England, assignor to Imperial Group Limited, Bedminster, England

Filed July 12, 1973, Ser. No. 378,529
Claims priority, application United Kingdom, July 12, 1972, 32481/72
Int. Cl.² B05C 5/02, 11/06
U.S. Cl. 118—63 4 Claims



1. Apparatus for impregnating an absorbent surface of a travelling web of material with a liquid and comprising a nozzle for discharging a liquid, means for causing a web of material to travel past the nozzle, a device for moving the

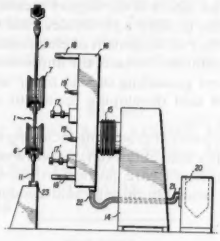
nozzle to and fro transversely to the direction of travel of the web past the nozzle so as to cause the liquid from the nozzle to be deposited in a sinuous line on the absorbent surface, an air nozzle adjacent and downstream of the liquid nozzle, which air nozzle is oriented to direct compressed air at peak portions of the sinuous line of liquid so as to spread the liquid on the absorbent surface, a heater for heating the liquid before deposition on the absorbent surface, and a further air nozzle adjacent and downstream of the first-mentioned air nozzle, which further air nozzle is oriented to direct compressed air at the spread peak portions of the sinuous line of liquid so as to cool the liquid.

3,906,894

APPARATUS ADAPTED FOR THE PROTECTIVE COATING OF THE RACE BETWEEN THE RIM AND DISC OF MOTOR VEHICLE WHEELS

Paolo Pesapane, Milan, Italy, assignor to Monter S.p.A., Novara, Italy

Filed Mar. 27, 1973, Ser. No. 345,445
Claims priority, application Italy, Mar. 31, 1972, 22703/72
Int. Cl.[2] B05C *5/00, 13/02*
U.S. Cl. 118—315 **7 Claims**



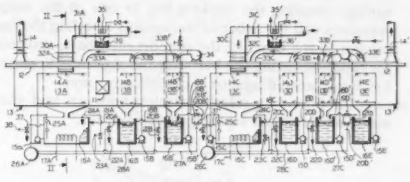
1. An apparatus adapted for automatically spray coating an annular seam existing where the rim and disc of a wheel join comprising a frame supported by an aerial conveyor, inclined struts fixed to each side of the frame and adapted to support on their free ends a wheel by its lower peripheral edge in a nonrotating vertical position, and coating devices for spray coating said wheel, said coating devices comprising two horizontally spaced fixed supports, a first elongated carriage adapted to move along a path parallel to the path of the frame and from the first to the second of said fixed supports at the same speed as the speed of the conveyor during the spray coating operation, a second carriage carried by the first carriage and provided with telescoping means for its alternatively moving towards and from said frame, a third carriage carried by the second carriage adapted to be moved vertically with respect to the frame and provided with a pair of rollers disposed to engage the peripheral edge of the wheel between said struts and to elevate the wheel from the free ends of the struts as the third carriage is elevated and to return the wheel to the struts when the third carriage is lowered, said third carriage being adapted to rotate one of said rollers while the wheel is disengaged from the struts and to thereby rotate the wheel, spray nozzles pointed towards the said seam and actuated while the wheel is rotating and fork-like means for alternatively locking the third carriage to the frame, all three carriages and at least one of said two rollers being adapted to be driven by driving means.

3,906,895

SPRAY TYPE APPARATUS FOR TREATMENT OF METAL SURFACE

Ikuo Morino, Toyonaka, and Minoru Makihara, Zama, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 26, 1972, Ser. No. 318,612
Claims priority, application Japan, Dec. 24, 1971, 46-002657
Int. Cl. B05b *1/28*
U.S. Cl. 118—326 **3 Claims**



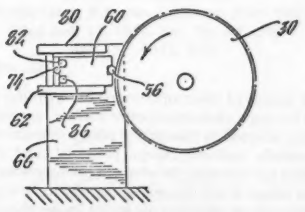
1. In a spray type, tunnel type apparatus for treatment of a metal surface with an aqueous solution containing a chemical reagent including a spray chamber having a treating region where the aqueous solution is sprayed onto the metal surface and a rinsing region where rinsing water is sprayed onto the metal surface previously treated at the treating region, the improvement which comprises the rinsing region being comprised of at least two zones including a last zone; conducting means provided between said zones and the treating region and the zone adjacent thereto in such manner that the water, after rinsing, can flow from the last rinsing zone through all the other zones to the treating region; a fresh water supply means provided at the last zone; and an evacuating means provided with a vapor-liquid separator and mounted in the treating region so as to eliminate water therefrom in a vaporized form.

3,906,896

INK APPLICATOR

Stanley M. Stansell, Columbus, Ohio, assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 214,873, Jan. 3, 1972, abandoned. This application Dec. 5, 1973, Ser. No. 422,053
Int. Cl.[2] G03G *15/10*
U.S. Cl. 118—637 **7 Claims**



1. In an electrostatographic reproduction system having a means for establishing a latent electrostatic image on a photoreceptive surface, a means for developing said latent electrostatic image by applying a polar ink to the image areas of the surface, said developing means having an ink applicator body which is positioned adjacent said photoreceptor surface for transferring ink from said applicator body to said photoreceptive surface, said applicator body having an array of lands and depressions formed on a surface thereof, a means for supplying ink to said applicator, the improvement for removing ink from said lands and regulating the level of ink in said depressions comprising;

an elongated body of elastomeric material of generally circular cross section;

means for supporting the elastomeric material in contact with the surface of said applicator, said means including a pair of spaced apart support members, a platform supported by the support members, a bar having a longitudinally extending groove in which the elongated body is supported, the bar being slidably seated on the platform, bias means coupled to the bar for pressing the elastomeric material into contact with the applicator, said bias means include a backing bar and a pair of springs, one of the springs coupling the backing bar to one of the support members and the other of the springs coupling the backing bar to the other of the support members, and means for rigidly securing the bar after the elastomeric material has been pressed against the applicator; and

means for providing relative motion between said elastomeric material and said applicator surface.

3,906,897

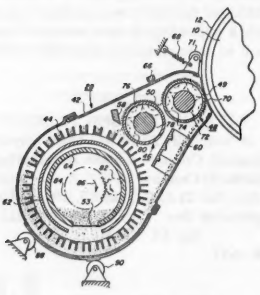
DEVELOPMENT APPARATUS

James R. Davidson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 255,259, May 22, 1972, Pat. No. 3,854,449. This application Jan. 4, 1974, Ser. No. 430,867

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—637 **4 Claims**



1. An improved electrophotographic printing machine of the type having a photoconductive surface, a corona generating device adapted to charge the photoconductive surface to a substantially uniform charge potential, and an exposure mechanism for exposing the charged photoconductive surface to a light image of the original document to be reproduced to record thereon an electrostatic latent image thereof, wherein the improvement includes:

means for depositing toner particles onto the latent image; means for actuating said toner depositing means in response to the latent image advancing to a predetermined location;

means, responsive to said toner depositing means being actuated, for moving said toner depositing means from an inoperative position spaced from the latent image to an operative position adjacent thereto; and

biasing means for resiliently urging said toner depositing means from the operative position adjacent the latent image to the inoperative position spaced therefrom when said toner depositing is de-energized.

3,906,898

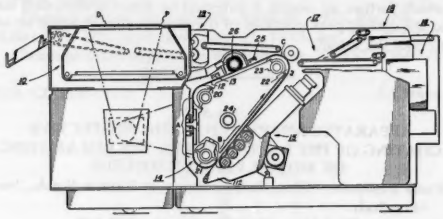
MAGNETIC BRUSH DEVELOPING APPARATUS

Terrence D. Charland, Pittsford, and Stanley D. Klett, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 255,721, May 22, 1972, abandoned. This application Feb. 13, 1974, Ser. No. 442,036

Int. Cl. G03g *13/06*

U.S. Cl. 118—637 **3 Claims**



1. In a magnetic brush developing apparatus having at least one magnetic brush roller assembly for applying developer materials to a photoconductive surface, said photoconductive surface being supported by a conductive substrate having at least one bare portion adjoining said magnetic brush roller assembly, the magnetic brush roller assembly including a rotatable exterior sleeve with magnet means disposed therewithin, and means to place a preset electrical bias on the roller assembly to further development of electrostatic latent images on the photoconductive surface, the improvement comprising: means to prevent grounding of said roller assembly with adjoining parts of said developing apparatus and loss of said roller assembly bias,

said means to prevent grounding including an insulating ring on said roller assembly exterior sleeve opposite said conductive substrate bare portion to prevent discharge of said roller assembly through said conductive substrate.

3,906,899

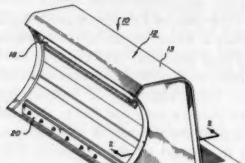
DEVELOPER SEAL

Ganesh L. Harpavat, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 10, 1974, Ser. No. 477,946

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—637 **8 Claims**



1. In electrostatographic copying apparatus wherein an image on an imaging surface is developed with imaging development material comprising magnetically attractable material in a developing station, and wherein a magnetic seal is provided adjacent said imaging surface to at least partially confine said developer material, the improvement in said magnetic seal wherein said magnetic seal comprises:

a pair of elongated magnetizable pole pieces extending across said imaging surface,

said pole pieces having thin edges extending toward, but spaced from, said imaging surface,

said pole piece edges being substantially spaced apart; and

spacing means between said pole pieces forming between said pole pieces edges an open channel recess extending away from said imaging surface and said pole piece edges, said channel recess being open to receive said magnetically attractable material between said pole pieces,

said magnetic seal having a magnetic field magnetically attracting said magnetically attractable material to said pole pieces and into said channel recess.

3,906,900

METHOD OF HANDLING SHRIMP EGGS

Yosuke Hirono, Crystal River, and Donald E. Sweat, Key West, both of Fla., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Sept. 5, 1972, Ser. No. 286,051
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—2 **15 Claims**

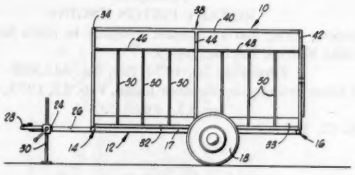
1. A method of spawning, and shipping shrimp eggs comprising the steps of: placing gravid female shrimp into spawning tanks; retaining the gravid female shrimp in the tank for a period of time sufficient for the eggs to be spawned; collecting the spawned eggs from the tanks; selecting an aliquot sample of the eggs to determine the viability thereof; placing the viable eggs into a sealed container at a concentration up to about 5,000 eggs per milliliter of sea water in the container; and controlling the temperature of the sea water during shipment within a predetermined range sufficient to prevent the eggs from hatching and progressing beyond the beginning of the protozoeal stage of growth during the shipment thereof and thereafter acclimating the shrimp in sea water under desired conditions for the subsequent growth thereof.

3,906,901

PORTABLE ROUND BALE FEEDER APPARATUS

Richard D. Cox, P.O. Box 387, Carrollton, Mo. 64633

Filed Sept. 26, 1974, Ser. No. 509,710
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—58 **7 Claims**



1. A portable round bale feeder apparatus comprising:

a horizontally disposed frame having a forward end and a rearward end;

a pair of wheels attached to said frame between said forward and rearward ends thereof for portably supporting said frame above the ground surface and so that the rearward end of said frame can be lowered to a position adjacent the ground surface by elevating the forward end of said frame;

a substantially flat floor attached to said frame;

an upstanding forward wall attached to the forward end of said frame;

a pair of open side walls adapted to allow livestock feeding therethrough attached to said forward wall and to said frame on opposite sides thereof, said side walls being inclined upwardly and outwardly from said frame; and

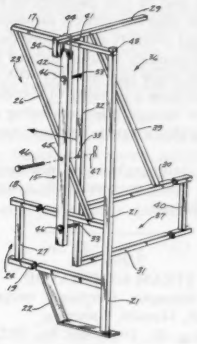
an upstanding end gate disposed at the rearward end of said frame and pivotally connected to one of said side walls so that said round bales can be loaded into said apparatus through said end gate at the rearward end of said frame.

3,906,902

HAYSTACK FEEDER APPARATUS FOR LIVESTOCK

Peggy J. Rose, 505 E. Milwaukee, Spencer, Iowa 51301

Filed Dec. 26, 1973, Ser. No. 427,677
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—60 **2 Claims**



1. A haystack feeder apparatus comprising:

a plurality of upright first panels, a pair of said first panels arranged in parallel relation to each other, said parallel first panels having upper and lower horizontal members, interconnected by horizontally spaced braces;

at least one upright second panel of a length to extend between said parallel first panels, said second panel having an upper member adapted to ride upon said first parallel panel upper members and with outer ends extended beyond said parallel first panels, said second panel movable along said parallel first panels in a direction parallel thereto;

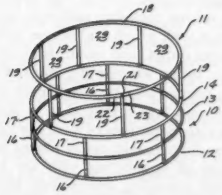
detachable means for limiting the horizontal movement of said second panel comprising an elongated locking bar suspended from each of said upper member outer ends, and at least one device fastenable to and extended between said locking bar and an adjacent end of said second panel, said device operable to engage one of said braces upon movement of said panel a first distance along said parallel first panels.

3,906,903

LIVESTOCK FEEDER

Lloyd L. Vandewater, R.R. No. 1, Dexter, Iowa 50070

Filed Jan. 11, 1974, Ser. No. 432,596
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—60 **1 Claim**



1. A livestock feeder for feeding a large cylindrical shaped upright bale of hay comprising:

a. a plurality of horizontal ring members vertically spaced equal distances apart including a lowermost ground supported ring member, a middle ring member, and an uppermost ring member,

b. first circumferentially spaced vertical members interconnecting said plurality of horizontal ring members, said first vertical members spaced equal distances apart and forming with said horizontal ring members first feeding openings,

c. a single horizontal ring member vertically spaced above the uppermost one of said plurality of ring members a distance greater than the vertical distance between adjacent ones of said plurality of ring members, and

d. other circumferentially spaced vertical members interconnecting said single ring member with said uppermost ring member to form a plurality of second feeding openings, said other vertical members being above and substantially centrally located between said first vertical members,

e. all of said ring members being of like diameter to provide for the feeder being concentrically arranged about and adjacent to said bale.

3,906,904

STEAM GENERATOR

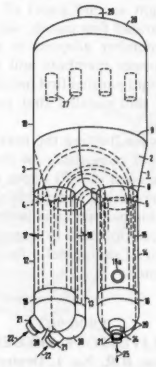
Werner Kraupa, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1973, Ser. No. 392,524

Claims priority, application Germany, Sept. 8, 1972, 2244207

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 **5 Claims**



1. A steam generator including inverted U-shaped tubes having return portions and vertical legs depending from said portions, casing means enclosing said legs, an enclosure having a lower portion with which said means upwardly connects and having a steam outlet, and means for conducting heating fluid through said tubes; wherein the improvement comprises said tubes being formed into two nests each having inlet and outlet groups of said legs arranged in a doubly bifurcated manner with the return portions of all of the tubes in the lower portion of said enclosure, said casing means being formed by individual casings all connecting with the enclosure's said lower portion and extending downwardly therefrom and respectively encasing said groups of legs individually, a tube sheet in each of said casings, the ends of each group of legs being mounted in the tube sheet in its encasing casing separate from the others, and a separate manifold for each of said tube sheets and the tubes of its group of the legs, the enclosure's said lower portion being contoured in a doubly bifurcated manner forming downwardly converging and approximately frusto-conical connections with said individual casings.

3,906,905

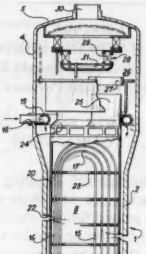
STEAM GENERATOR

Jean-Louis Andrieu, Paris; Yves Bonnet, Le Mesnil Saint Denis, and Jean-Jacques Verdeau, Gif-sur-Yvette, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 20, 1974, Ser. No. 498,924

Int. Cl.² F22B *1/06*

U.S. Cl. 122—32 **6 Claims**



1. A steam generator comprising a tube plate, holes in said plate, a bank of U-tubes having ends connected in the holes, said U-tubes, receiving a circulation of a primary fluid and a secondary fluid externally surrounding said U-tubes, wherein the ends of the U-tubes of the bank are disposed in spaced relation in the tube plate with a pitch of decreasing value in the direction of flow of the secondary fluid, the tube arms through which the hot primary fluid circulates being disposed with a pitch of higher value than that of the tube arms through which the cold primary fluid circulates.

3,906,906

ROTARY PISTON ENGINE

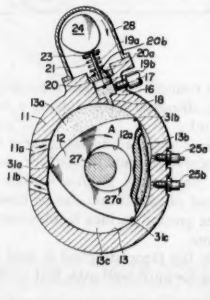
Fuminao Arai, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 20, 1974, Ser. No. 443,995

Claims priority, application Japan, Feb. 23, 1973, 48-22451

Int. Cl.² F02B *53/04*

U.S. Cl. 123—8.13 **2 Claims**



1. In a rotary piston engine having a case which includes a center housing with a polyarcuate inner peripheral surface and side plate portions for hermetically sealing the side parts of said center housing, a polygonal piston being provided within said case in a manner to be eccentrically rotatable therein, said piston sliding along the inner peripheral surface of said center housing at corner end parts of said piston, the interior of said case being partitioned into a plurality of work-

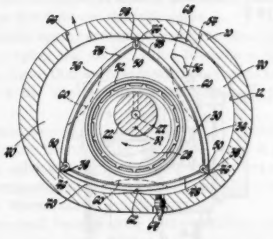
ing chambers, the volume of said each working chamber being varied at the sliding of said piston within said case, a suction port and an exhaust port being provided in said case, the improvement comprising a cylindrical auxiliary mixture chamber at an outer peripheral part of said center housing, means defining a communication hole in said center housing for fluidly communicating said auxiliary mixture with the interior of the particular working chamber communicating with said suction port, a nozzle and a mixture push-out member within said auxiliary mixture chamber, said nozzle being adapted to inject fuel into said auxiliary mixture chamber, a shaft driven by said piston, said mixture push-out member sliding airtightly on a cylindrical inner peripheral surface of said auxiliary mixture chamber and reciprocatingly driven by said shaft driven by said piston to inject a mixture in said auxiliary mixture chamber into said particular working chamber, so that in an engine cycle suction stroke of sucking only a lean mixture of air/fuel through said suction port, after the particular corner end part of said piston within said particular working chamber as situated on the fore side in the direction of rotation passes said communication hole, said mixture push-out member is caused to suck a portion of said lean mixture of air/fuel from within said particular working chamber into said auxiliary mixture chamber and simultaneously to inject the fuel from said injection nozzle so as to produce a rich air/fuel mixture within said auxiliary mixture chamber, and that in a period of the cycle from the approximate termination of the suction stroke of said particular working chamber to the first half of a compression stroke, said mixture push-out member is caused to inject said rich mixture in said auxiliary mixture chamber into said particular working chamber through said communication hole.

3,906,907

INTERNAL COMBUSTION ROTARY ENGINE WITH INTERNAL EXHAUST GAS RECIRCULATION

Raymond P. Canale, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,401
Int. Cl.² F02B *53/04*
U.S. Cl. 123—8.13 **2 Claims**



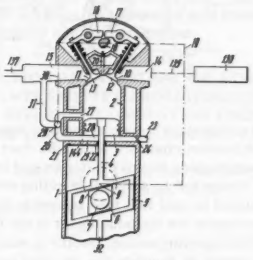
1. An internal combustion rotary engine having housing means with an inwardly facing peripheral wall and oppositely facing inner end walls cooperatively defining a cavity, a crankshaft rotatably supported in said housing and having an eccentric located in said cavity, a rotor rotatably mounted on said cavity, said rotor having peripheral faces facing said peripheral wall providing a plurality of chambers that are spaced about and move with said rotor while varying in volume as said rotor rotates, intake passage means in said housing including an intake port periodically opened by said rotor to deliver a fresh air-fuel mixture to said working chambers as they expand in an intake phase, exhaust passage means including an exhaust port periodically opened by said rotor to receive exhaust gas from said working chambers as they contract in an exhaust phase following an expansion or power phase, and a peripherally extending exhaust gas recirculation slot in said peripheral wall arranged relative to said intake port and said exhaust port so as to connect the trailing portion of each said working chamber only when it is ending the intake phase and beginning the compression phase to the leading portion of the trailing working chamber only when it is completing the exhaust phase whereby exhaust gas from the leading portion of each said working chamber near the end of the exhaust phase is directed by said exhaust gas recirculation slot to the trailing portion of the leading working chamber at the ending of the intake phase and the beginning of the compression phase with the percentage of exhaust gas recirculated increasing with increasing intake passage vacuum and decreasing rotor speed.

3,906,908

INTERNAL COMBUSTION ENGINE

Walter Franke, Maschen, Germany, assignor to Motoren Forschungs GmbH & Co. KG Franken Motoren, Germany

Filed Nov. 13, 1972, Ser. No. 306,039
Claims priority, application Germany, Nov. 15, 1971, 2156586
Int. Cl.² F02B *75/02*
U.S. Cl. 123—75 CC **8 Claims**

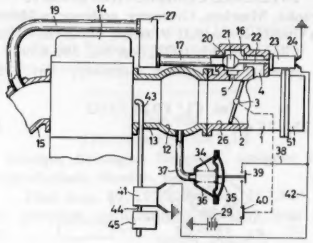


1. An internal combustion engine comprising an axially extending cylinder having a head at one end and a bottom at the other, a piston arranged to reciprocate in said cylinder and to define with said cylinder, in combination with said head, a power chamber and, in combination with said bottom, an air compression chamber, said piston, as it reciprocates within said cylinder, has a lower dead center position adjacent the bottom end of said cylinder, a first intake port and an exhaust port each formed in the head end of said cylinder and communicating with the power chamber therein, means for supplying a fuel-air mixture to said first intake port for introduction into said power chamber, ignition means for initiating a combustion of the fuel-air mixture in said power chamber, means for controlling flow through said first intake port and said exhaust port, wherein the improvement comprises a partition forming a sealed closure for the bottom end of said cylinder, a second intake port connected to said cylinder below the lower dead center of said piston, means for controlling said second intake port, said piston arranged to perform a power stroke in said cylinder in response to the combustion of the fuel-air mixture within said power chamber with said piston terminating the power stroke in the lower dead center position, transfer means for transferring compressed air from said compression chamber to said exhaust port at the termination of said power stroke, said transfer means comprises a first opening from said cylinder in the bottom end thereof below the lower dead center of said piston, a second opening in said cylinder located below the head end thereof and above said piston in its lower dead center position, a transfer duct located exteriorly of said cylinder and interconnecting said first and second openings, said transfer means including a valve located in said transfer duct, a branch duct connected at one end to said transfer duct intermediate said first said openings and at its other end to said exhaust port at a location spaced outwardly from said cylinder, and said valve arranged to direct flow through said transfer port from said first opening to one of said branch duct and said second opening.

3,906,909
INTERNAL COMBUSTION ENGINE OF THE FUEL INJECTION TYPE HAVING MEANS FOR REDUCING THE EMISSION OF UNBURNED PRODUCTS WITH THE EXHAUST GASES

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 191,453, Oct. 21, 1971, abandoned. This application Dec. 14, 1973, Ser. No. 424,738
Claims priority, application Italy, Oct. 24, 1970, 7344/70
Int. Cl.[2] F02D *31/00*
U.S. Cl. 123—97 B **3 Claims**



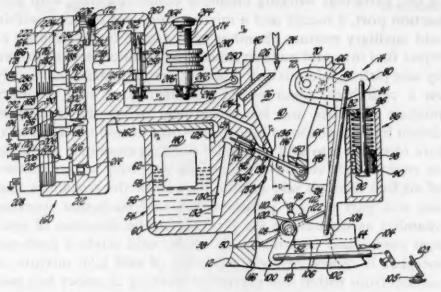
1. An internal combustion engine of the fuel injection type, comprising a combustion chamber, an intake duct leading to said chamber, fuel injecting means located in said intake duct, fuel feed means connected to said fuel injecting means, regulating means coupled to said fuel feed means to regulate the fuel feed, air feed means for introducing air in the intake duct upstream to the fuel injecting means, throttling means coupled to said air feed means to regulate the air feed concurrently with the operation of said regulating means, fuel feed cut-off means, air feed cut-off means and control means responsive to the concurrent operation of said regulating means and said throttling means and to the engine speed to actuate the fuel feed and air feed cut-off means to cut off the fuel feed and the air feed when said regulating means and said throttling means are arranged to regulate the fuel feed and the air feed at the idling values and the engine speed is higher than the idling speed, the air feed means comprising a main duct in which said throttling means is arranged and an auxiliary duct in parallel therewith, said air feed cut-off means being defined by a valve member which is actuated to close said auxiliary duct when the throttling means closes said main duct and the engine speed is higher than the idling speed, and wherein the combustion chamber is provided with an exhaust duct which is connected to the intake duct via a recycling duct provided with gas recycling cut-off means which normally closes said recycling duct and which is controlled to open said recycling duct when said air feed cut-off means is actuated.

3,906,910
CARBURETOR WITH FEEDBACK MEANS AND SYSTEM

Emil Szlaga, Jr., Sterling Heights, Mich., assignor to Colt Industries Operating Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,579
Int. Cl.[2] F02M *11/00*
U.S. Cl. 123—119 R **25 Claims**

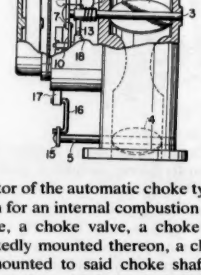
1. In a carburetor type fuel metering device, for an internal combustion engine, of the type having induction passage means with venturi means carried therein for creating a reduced first pressure proportional to the square of the flow of air therethrough, a fuel bowl, a fuel passage between the fuel bowl and an orifice for discharging fuel adjacent the venturi and a throttle valve disposed in the inducation passage downstream from the venturi means for controlling the flow of a fuel-air mixture to the engine and wherein said first pressure is employed in combination with a relatively high, substantially atmospheric second pressure in the fuel bowl as the only means for causing metered main fuel to flow to said induction passage means, said device being free of main fuel flow pressurizing means for pressurizing main fuel at pressures appreciably above atmospheric pressure, the improvement of providing additional means responsive to indicia of engine operation, said additional means being effective for at times modifying the effective magnitude of said first pressure in response to said indicia of engine operation in order to thereby correspondingly modify the effect of said first pressure on the rate of metered fuel flow and thereby cause said rate of metered fuel flow, at any air flow during such modification of the effect of said first pressure, to be reflective of said indicia of engine operation.



3,906,911
FAST IDLE ASSEMBLY FOR CARBURETORS HAVING AUTOMATIC CHOKE

Masahiko Nakada, and Hirofumi Matsumoto, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed July 23, 1973, Ser. No. 381,423
Claims priority, application Japan, Aug. 10, 1972, 47-79462
Int. Cl.[2] F02M *1/10*
U.S. Cl. 123/119 F **2 Claims**



1. A carburetor of the automatic choke type including a fast idle mechanism for an internal combustion engine comprising a throttle valve, a choke valve, a choke shaft having said choke valve fixedly mounted thereon, a choke lever mechanism fixedly mounted to said choke shaft, a fast idle cam revolvably mounted to said choke shaft, linkage means operatively interconnecting said fast idle cam and said throttle valve to control the idling position of said throttle valve, first spring means operatively connected between said choke lever mechanism and said fast idle cam to effect a predetermined angular displacement therebetween, and second spring means having a first and a second end with the first end of said second spring means fixed relative to said carburetor and with the second end of said second spring means including a first engagement member for engaging said choke lever and a second engage-

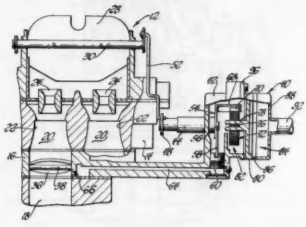
ment member for engaging said fast idle cam, said second spring means being thermostatically responsive to the operating temperature of said engine to control the opening of said choke valve and the working angle of said fast idle cam, said second thermostatically responsive spring means cooperating with said first spring means to effect continued operation of said fast idle mechanism for a period of time after said choke valve has fully opened.

3,906,912

TWO-PHASE CHOKE SYSTEM WITH PRIMARY AND SECONDARY HEATING

Delma J. Jackson, Dearborn, and John D. Medrick, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 16, 1973, Ser. No. 416,556
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—119 F **13 Claims**



1. A two phase automatic shoke system for use with a carburetor having an air/fuel induction passage open at one end and adapted to be connected to an engine intake manifold at the other end for subjecting the passage to varying manifold vacuum, the passage having a throttle valve mounted for a variable movement between positions opening and closing the passage to control air/fuel flow through it,

the choke system including an unbalance mounted, air movable, choke valve mounted anterior of the throttle valve for variable movement across the passage to control airflow towards the throttle valve,

thermostatic spring means operably connected to the choke valve urging the choke valve towards a closed position with a force that increases with decreases in the temperature of the thermostatic means from a predetermined level,

a first heat source of engine heated air transferring engine heat to the thermostatic means to warm it and reduce its choke valve closing force comprising a hot air duct operably connected to flow air past the engine exhaust system to the thermostatic means,

and a second heat source intermittently operable for at times transferring additional engine heat to the thermostatic means to and concurrent with the heat transferred to it by the first source for further reducing the choke closing force of the thermostatic means, comprising a duct conducting hot engine exhaust gases to an area contiguous to the thermostatic means.

3,906,913

SYSTEM FOR MINIMIZING INTERNAL COMBUSTION ENGINE POLLUTION EMISSION

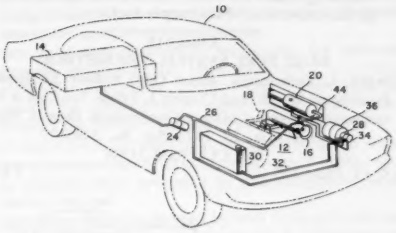
Jack H. Rupe, Sunland, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Aug. 10, 1973, Ser. No. 387,342
Int. Cl. F02m *13/08*
U.S. Cl. 123—121 **18 Claims**

1. A system for minimizing the air pollution output of an internal combustion engine comprising

an induction system for said engine having means for mixing a hydrogen rich gas, a liquid fuel and air;

means for controlling said means for mixing over the operating range of said engine to provide a gas, fuel and air mixture in proportions within predetermined upper and



lower equivalence ratio bounds and yet are within the flammable range of said mixture which minimize air pollution by said engine, and

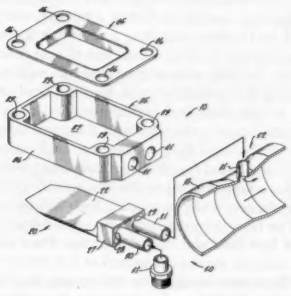
means for applying the output of said means for mixing to said internal combustion engine.

3,906,914

REDUCTION AND CONTROL OF ATMOSPHERIC POLLUTANTS EMITTED FROM GASOLINE POWERED INTERNAL COMBUSTION ENGINES

James W. Kirkbride, 1071 Santa Rosa Ave., Costa Mesa, Calif. 92626

Filed Apr. 4, 1973, Ser. No. 347,903
Int. Cl. F02m *31/00*
U.S. Cl. 123—122 AA **4 Claims**



1. In a gasoline powered internal combustion engine including a carburetor having one or more outlet ports mounted on an intake manifold having one or more mating inlet ports, the improvement comprising means for converting said gasoline to its gaseous state and simultaneously causing isotropic mixing of the gasoline and oxygen molecules, said means comprising:

heating means including a plate having a generally rectangular planar, solid, upper surface, the area of which is equal to or greater than the total area of said carburetor outlet ports;

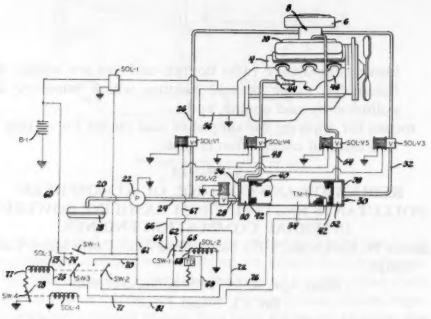
means for mounting said heating means with said upper surface of said plate directly in the path of the fuel/air mixture exiting said carburetor outlet ports to cause essentially all of the fuel droplets in said fuel/air mixture to splash against said upper surface of said plate and to cause said mixture to follow a tortious path around said plate causing gross turbulence of said fuel/air mixture, said mounting means providing an air flow area around said heating means which is at least as great as the total area of said carburetor outlet ports; and

means for applying heat to said heating means in an amount which is directly proportional to the speed of said engine to maintain the temperature of said heating means essentially constant over at least a substantial portion of the range of engine operating speeds, said heating means including means for evenly distributing said applied heat to the entire area of said upper surface.

3,906,915
DUAL FUEL SYSTEM AND METHOD

Edward A. Bednarczyk, Royal Oak; Robert A. Spaulding, Huntington Woods, and Clayton J. Trible, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1973, Ser. No. 346,077
Int. Cl.² F02M *25/08*
U.S. Cl. 123—127 **5 Claims**

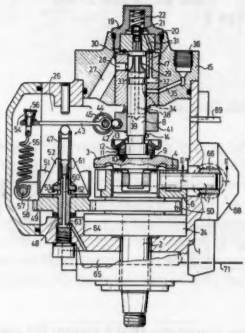


1. A fuel system for an internal combustion engine having a fuel induction system including a dual fuel carburetor and an electrical ignition system including a battery and an ignition switch, said fuel system including a reservoir for regular fuel, a fuel pump having an inlet connected to said reservoir and a pump outlet, conduit means connected to said pump outlet and includng a first conduit means, having a first valve therein, connected to the dual fuel carburetor for supplying regular fuel to the dual fuel carburetor and a second conduit means connected to the dual fuel carburetor, said second conduit means including a fuel fractionator containing a bed of adsorbent material adapted to retain the low volatile components of fuel flowing therein while permitting high volatile components of the fuel to flow therethrough and valve means controlling the flow of fuel into and out of said fuel fractionator, valve controlled conduit means connected at one end to a source of desorbing fluid, intermediate its end to said fuel fractionator and at its opposite end to the fuel induction system to effect desorption of low volatile components of fuel from said fuel fractionator by the flow of desorbing fluid therethrough and to convey the desorbed fuel and desorbing fluid from said fuel fractionator to the fuel induction system of the engine for consumption therein and, control means connected to the ignition system and including switch means operatively connectable to said valve means and to said first valve and said valve controlled conduit means, said control means further including time delay means operatively connected to said switch means to normally sequentially position said switch means for actuating said valve means upon engine start-up and then to actuate said first valve and said valve controlled conduit means while de-actuating said valve means to permit regular fuel to be supplied to the dual fuel carburetor and to permit desorbed fuel from said fuel fractionator to be conveyed to the engine for consumption therein, said control means further including a holding circuit control means operatively connected to said switch means and to the ignition system between the battery and the ignition switch to normally maintain an energized circuit to said switch means after initial actuation by said time delay means to effect connection of the switch means with said first valve and said valve controlled conduit means and, regeneration cycle signal control means connected to said holding circuit control means to de-actuate said holding circuit control means after a regeneration cycle has been completed as indicated by a signal produced by said regenerating cycle signal control means.

3,906,916
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Helmut Laufer, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 24, 1972, Ser. No. 309,009
Claims priority, application Germany, Nov. 26, 1971, 2158689
Int. Cl. F02m *39/00*
U.S. Cl. 123—139 AP **4 Claims**



1. In a fuel injection apparatus serving an internal combustion engine, said apparatus being of the known type that has (a) a fuel injection pump delivering fuel quantities to said engine for injection, (b) an rpm regulator having a governor member, (c) means connecting said governor member to said fuel injection pump for varying the terminal moment of injection to vary said fuel quantities, (d) a fuel supply pump connected to said fuel injection pump to supply the latter with fuel, the output pressure of said fuel supply pump being a function of the engine rpm and (e) a hydraulic setting mechanism connected to said fuel injection pump for varying the moment of injection in response to a change in said output pressure, the improvement comprising:

A. a housing, within which elements (a)-(e) are mounted, said housing defining an inner chamber into which fuel is delivered by said fuel supply pump;

B. means extending into said chamber and defining a channel leading from said chamber to the suction side of said fuel supply pump; and

C. means forming part of said governor member, said last named means cooperating with said channel means to change the flow passage section thereof as a function of the position of said governor member for causing a drainage of a variable fuel quantity from said chamber to said suction side of said fuel supply pump for altering the output pressure thereof.

3,906,917
IGNITION ADJUSTMENT DEVICE

Daniel C. Lorti, 17621 Irvine Blvd., Suite 101, Irvine, Calif. 92680

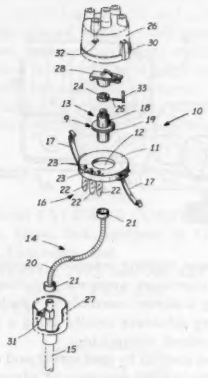
Filed Aug. 29, 1974, Ser. No. 501,595
Int. Cl.² F02P *17/00*
U.S. Cl. 123—146.5 A **7 Claims**

1. An adaptive mechanism for implementing the adjustment of an ignition system for an internal combustion engine having a plurality of spark plug ignited combustion chambers by

operatively disposing the distributor cap and rotor from the distributor shaft and ignition coil breaker points comprising:

a plate having an opening therein;

attaching means for removably securing said plate in fixed relationship to said distributor cap about the entrance thereto;



shaft means rotatably mounted to said plate within said opening therein, one end of said shaft means being removably coupled to said distributor rotor in fixed relationship therewith; and

coupling means for fixedly interconnecting said shaft means to said distributor shaft for synchronous rotation therewith.

3,906,918

SPARK IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINES

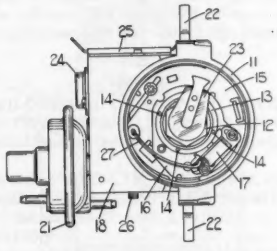
John Longstaff-Tyrrell, Birmingham, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Aug. 20, 1973, Ser. No. 389,498

Claims priority, application United Kingdom, Aug. 18, 1972, 38602/72

Int. Cl.[2] F02P *3/04*

U.S. Cl. 123—148 E **4 Claims**



1. In an internal combustion engine having a plurality of spark plugs, an ignition coil, an inlet manifold, and means for distributing electrical impulses to said plugs in a predefined order, a spark ignition apparatus which comprises:

a rotatable shaft driven by said engine;

a hollow casing within which said shaft is rotatably mounted;

timing means rotatably mounted with respect to said shaft within said casing;

a sensor mounted to said timing means so as to be rotatably adjustable with respect to said shaft along with said timing means;

means coupled to and rotating with said shaft, said sensor being responsive to the angular position of said coupled means for generating output signals;

means connected adjacent to said casing for separately housing semiconductor electronic circuit component means for responding to said output signals from said sensor for opening and closing an electrical circuit through the primary winding of said ignition coil;

said semiconductor electronic circuit component means being mounted on said housing means which further serve to dissipate heat generated by said component means during use; and

a vacuum actuator supported by said housing means and coupled to said sensor, said actuator in communication with the inlet manifold of said engine for adjusting the angular position of said sensor relative to said casing according to the pressure conditions in the inlet manifold of said engine.

3,906,919

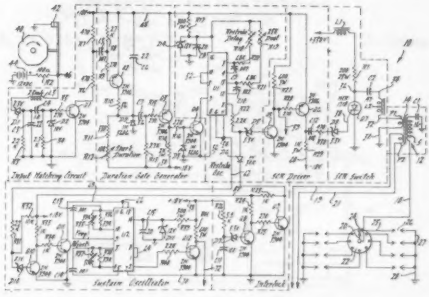
CAPACITOR DISCHARGE IGNITION SYSTEM WITH CONTROLLED SPARK DURATION

Joseph R. Asik, Bloomfield Hills, and Mitsugu Hanabusa, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 24, 1974, Ser. No. 463,692

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **9 Claims**



1. In combination with an internal combustion engine, a capacitor discharge ignition system, which comprises:

an ignition coil having first and second primary windings, a secondary winding and a ferromagnetic core about which said windings were wound;

a spark plug having electrodes spaced to form a spark gap, one of said electrodes being coupled to one terminal of said secondary winding;

a first capacitor connected in series with said spark gap, one terminal of said first capacitor being coupled to the other terminal of said secondary winding;

a second capacitor coupled to said first primary winding;

a DC source of electrical energy;

first circuit means, coupled to said second capacitor and to said first primary winding, for charging said second capacitor from said DC source of electrical energy and for discharging said second capacitor through said first primary winding in timed relation to operation of said engine;

second circuit means, coupled to said second primary winding, for producing an oscillatory current in said second primary winding for a predetermined time interval subsequent to each discharge of said second capacitor through said first primary winding;

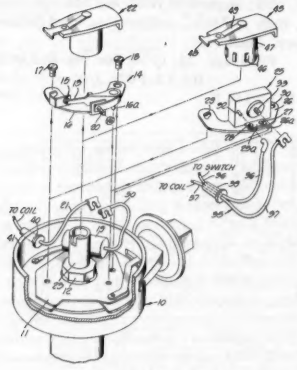
the discharge of said second capacitor through said first primary winding and the subsequent production of said oscillatory current in said second primary winding producing, for at least a portion of said predetermined time interval, a voltage in the secondary circuit of ignition coil which oscillates at a frequency defined by the expresion $f = V_m/4N_s\Phi_s$ where V_m is the instantaneous maximum voltage across said first capacitor, N_s is the number of turns in said secondary winding, and Φ_s is the magnetic flux within said secondary winding when said ferromagnetic core of said ignition coil is magnetically saturated.

3,906,920

IGNITION APPARATUS AND SYSTEM

Lewis W. Hemphill, Fountain Valley, Calif., assignor to Per-Lux, Inc., Covina, Calif.

Filed Apr. 25, 1974, Ser. No. 463,853
Int. Cl.[2] F02P *3/02*
U.S. Cl. 123—148 E **16 Claims**



1. In distributor apparatus for an engine, an ignition timing and pulse generating assembly comprising

sensor and circuit module means, said module means including a Hall cell sensor and a circuit connected with said sensor and responsive thereto for generating switching signals for an ignition coil of an engine,

plate means for said module means for enabling said module means to be mounted within a distributor of said engine and for providing a heat sink for said module means, said plate means providing a common electrical conductor connected with the circuit of said module means and for providing an electrical connection with a power source for said engine,

cable means for connection with said module means, said cable means having conductors for supplying power to said module means from the power source of said engine and for connecting an output of said module means with said ignition coil of said engine, and

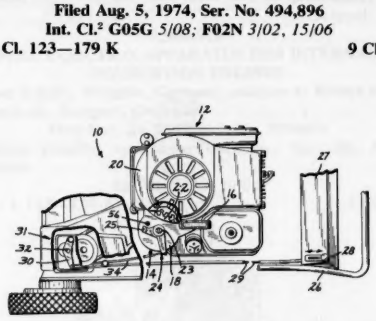
rotor means for connection with a rotary member of said distributor for rotating said rotor means in synchronism with engine rotation of said engine, said rotor means comprising a wall with a plurality of spaced permanent magnets having outer surfaces for movement closely contiguous with the sensor of said module means.

3,906,921

LAWN MOWER STARTING INTERLOCK

Henry B. Tillotson, Minneapolis, and Robert A. Kenkel, Edina, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 5, 1974, Ser. No. 494,896
Int. Cl.[2] G05G *5/08;* **F02N** *3/02, 15/06*
U.S. Cl. 123—179 K **9 Claims**



1. Lawn mower starting interlock apparatus for, under a predetermined condition, preventing starting of the engine of a mower having a starter assembly in which a starting pinion carrying a spring advances axially along a path into engagement with a flywheel, comprising:

a. a projection carried by said spring and extending parallel to and in the normal direction of advance of said pinion;

b. restraining means actuatable to interfere with travel of said projection to impede advance of said pinion into engagement with said flywheel; and

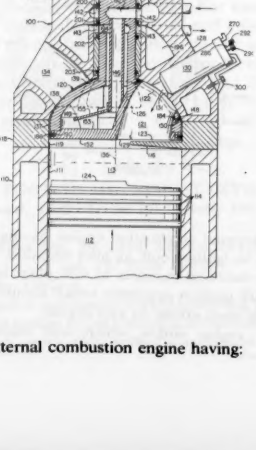
c. actuator means for sensing said predetermined condition and connected to actuate said restraining means in response thereto.

3,906,922

STRATIFIED CHARGE ENGINE

Ernest Blaney Dane, Jr., 57 Tyler Rd., Belmont, Mass. 02178

Continuation-in-part of Ser. No. 406,560, Oct. 15, 1973, abandoned, and a continuation-in-part of Ser. No. 494,991, Aug. 5, 1974, abandoned. This application Sept. 6, 1974, Ser. No. 503,604
Int. Cl.[2] F01L *7/18*
U.S. Cl. 123—190 B **14 Claims**



1. In an internal combustion engine having:

a combustion chamber;
a member having an elongated passage therein one end of said passage communicating with said combustion chamber and comprising an unrestricted opening into said combustion chamber; and
a fuel injector arranged to inject fuel into the other end of said passage;
that improvement in which:
a partition partially blocks said opening and defines with said passage a fuel injection chamber with a restricted open throat communicating with said combustion chamber during injection of fuel into said passage;
said member and said partition being mounted to said engine for rotation relative to each other and said partition having a limited circumferential extent;
whereby said partition is removed by said relative rotation to unblock said opening after injection of fuel into said passage.

3,906,923

PISTON AND CYLINDER CONSTRUCTION

Harry E. Harker, Hope, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 10, 1973, Ser. No. 423,269
Int. Cl.[2] F02F *3/00*
U.S. Cl. 123—193 CP **20 Claims**

1. In an internal combustion engine having a cylinder liner with the exterior surface thereof defining a wet wall of an encompassing chamber for a liquid coolant, and a reciprocating piston disposed within said liner and being provided with a depending skirt section having a thrust area formed on the exterior thereof; a method of preventing cavitation on the wet surface of the liner, comprising mounting an insert on the thrust area of the exterior of the skirt section by laterally sliding said insert relative to said skirt section while the piston and cylinder liner are in substantially disassembled relation, and assembling the piston within the cylinder liner so that the insert snugly engages in continuous sliding contact the liner interior surface to restrain lateral displacement of the piston relative to the cylinder liner during reciprocatory movement of the piston and insert as a unit within the cylinder liner.

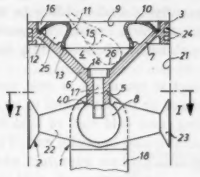
3,906,924

PISTON WITH CENTRAL COMBUSTION CHAMBER FOR INJECTION-TYPE INTERNAL COMBUSTION ENGINES

Ludwig Elsbett, Industriestrasse 14, D 8543 Hilpoltstein, Germany

Continuation of Ser. No. 254,219, May 17, 1972, abandoned. This application June 21, 1974, Ser. No. 481,775
Int. Cl.[2] F02F *3/02, 3/14, 3/26*
U.S. Cl. 123—193 P **5 Claims**

1. A piston assembly for a fuel injection type internal combustion engine having an annulus at its upper end and a central combustion chamber in the piston crown formed by a wall converging downwardly from said annulus to the bottom of said chamber, said combustion chamber comprising a hot top section for quick fuel vaporization and a relatively cold bottom section, and an annular wall portion in the combustion chamber throat at the top of said piston extending radially inwardly from said annulus at its top edge to a curved annular internal rim and thence downwardly to its lower edge secured to said converging wall at a point between said annulus and the bottom of said chamber, said wall portion being spaced from the converging wall of the piston between its top and bottom edges with a heat barrier means in said space, said



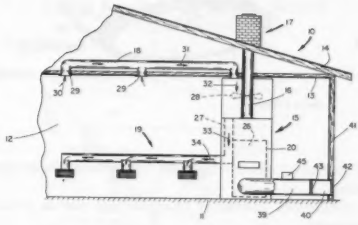
annular member having an axial depth equal to the depth of the fuel spray during idling of the engine, whereby the annular wall portion becomes incandescent when the engine is operating as a fuel injection engine, and forms the hot combustion chamber section and the bottom section is cool and forms the cold chamber section.

3,906,925

HEATING SYSTEM WITH EXTERIOR AIR INLET FOR COMBUSTION CHAMBER

Robert S. Dyer, 21 W. 16th St., Apt. 1-B, Indianapolis, Ind. 46202

Continuation-in-part of Ser. No. 303,711, Nov. 1, 1972, Pat. No. 3,805,764. This application Mar. 7, 1974, Ser. No. 449,022The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.
Int. Cl.[2] F24F *3/06*
U.S. Cl. 126—110 R **3 Claims**



1. In combination with a building and a furnace for heating said building including a combustion chamber having an outlet and a flue connected to said outlet leading from said chamber to exteriorly of said building for escape of exhaust gases, first means leading from said combustion chamber to allow air to pass therethrough to said chamber, said furnace further includes a heating passage adjacent said combustion chamber, cold air ducts connected to said furnace which lead from interiorly in said building to said heating passage, and hot air ducts connected to said furnace which lead from said combustion chamber terminating within said building, means mounted in said passage operable to force air from said cold air ducts through said heating passage and out said hot air ducts, an air inlet duct connected to said furnace at said first means and extending exteriorly of said building allowing air outside said building to pass therethrough to said combustion chamber for combustion purposes, said air inlet duct and said first means and said combustion chamber being constructed to allow air flow into said chamber only through said air inlet duct;
said furnace includes a first wall, a pair of said walls and a bottom wall connected together with said first means including a plurality of tubes mounted to said first wall

and extending outwardly directly from said combustion chamber, wherein the improvement comprises:

said furnace further including enclosure walls mounted to said side walls, said bottom wall and said first wall defining an enclosure into which said tubes open, said air inlet duct is connected to one of said enclosure walls allowing air from externally of said building to pass therethrough into said enclosure, said enclosure is sealed to allow air to enter said combustion chamber only from said air inlet duct;

said air inlet duct is mounted at one end to one of said enclosure walls at an opposite end to an exterior side wall of said building, said side wall of said building including a grate mounted to said opposite end of said air inlet duct; a filter mounted to said air inlet duct which filters incoming exterior air passing through said air inlet duct and wherein:

said furnace is a forced air down draft furnace;

first valve means mounted in said air inlet duct operable to control the amount of incoming exterior air passing into said combustion chamber.

3,906,926

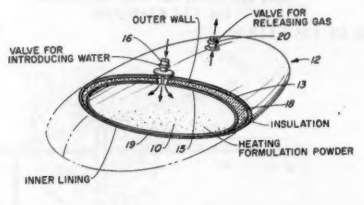
HEAT SOURCE FOR CURING UNDERWATER ADHESIVES

Richard M. Staples, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 19, 1974, Ser. No. 507,918

Int. Cl.² F24J *1/02*

U.S. Cl. 126—263 **13 Claims**



1. A portable electrochemical underwater heat source, comprising:

a. a waterproof container operable for use as a heating chamber;

b. at least one wall of said container operable to conduct heat therethrough for transferring heat from inside said container to a surface immediately adjacent said at least one wall operable to conduct heat therethrough, the remaining walls of said container being thermally insulated from the surrounding environment;

c. said container having an outer wall and an inner lining, and thermal insulation material is provided between said outer wall and said inner lining only in said remaining walls where insulation is desired, said at least one wall operable to conduct heat therethrough being free of said thermal insulation material;

d. a mixture of dry powdered chemicals in said container which are non-reacting in the dry state, said mixture of dry powdered chemicals upon the addition of water thereto operable to react rapidly to generate heat in an exothermic reaction;

e. means for introducing a desired amount of water into said container and retaining the water therein;

f. means for venting away any gases from said container that may be generated during said exothermic reaction;

g. the proportions of said mixture of dry powdered chemicals and said water being varied as desired to produce various temperatures from said reaction;

h. said thermally insulated container walls also being operable to direct heat generated inside said container in the direction of said at least one wall operable to conduct heat therethrough.

3,906,927

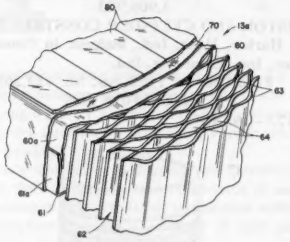
SOLAR-THERMAL POWER SYSTEM EMPLOYING ADJUSTABLE CURVATURE REFLECTIVE PANELS AND METHOD OF ADJUSTING REFLECTIVE PANEL CURVATURE

Harry W. Caplan, 3397 E. Monmouth Rd., Cleveland Heights, Ohio 44118

Continuation-in-part of Ser. No. 407,943, Oct. 19, 1973, Pat. No. 3,841,738. This application Dec. 12, 1973, Ser. No. 423,979The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **29 Claims**



1. An adjustable curvature reflector for solar-thermal power systems, comprising in combination:

a. a support structure;

b. a panel structure overlying portions of said support structure, said panel structure including first and second sheets of material positioned in uniformly spaced relationship to define the thickness of said panel structure, and a cellular core of uniform thickness interposed between and bonded to said first and second sheets, said core being formed from strips of material positioned in side-by-side relationship and bonded together at spaced intervals to define an array of open-ended cells closed at opposite ends by said sheets;

c. reflective means secured to said panel structure and defining a reflective surface;

d. mounting means including a plurality of elongate members each having one end region connected to one of said structures and having the other end region extending through the other of said structures for mounting said panel structure on said support structure; and,

e. fastening means interposed between said mounting means and said other structure to adjustably position said mounting means relative to said other structure for deforming portions of said panel structure to selectively adjust and retain a desired curvature of said reflective surface.

3,906,928

SOLAR HEATER CONTROL SYSTEM AND METHOD

Allen C. Wright, Moraga, Calif., assignor to Fafco Incorporated, Redwood City, Calif.

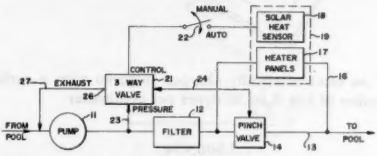
Filed Mar. 28, 1974, Ser. No. 455,870

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **9 Claims**

1. In a system for controlling temperature in a confined body of water having a system inlet and outlet in communication with the body of water, a pump in communication with the inlet for moving the water under pressure, a filter for receiving the water under pressure and having an upstream

pressure higher than a downstream pressure, first and second parallel water paths for receiving the water from the filter and being in communication with the system outlet, an array of solar heater panels within the first water path for passing water therethrough and for exchanging heat between the heater panels and the passing water, means for sensing solar energy positioned proximate to the heater panels for providing a control signal related to available solar energy for raising the water temperature above a predetermined temperature, means receiving said control signal for controlling flow alternately in said first and second water paths, a flow direction valve in the second water path for controlling water flow



therethrough, a pressure line connected between said means for controlling and the upstream side of the filter for communicating the prefilter pressure to said last named means, and a control line connected between said means for controlling and said flow direction valve, so that when said means for sensing solar energy detects availability of solar energy for raising water temperature above the predetermined temperature, said control signal actuates said means for controlling to communicate said pressure line with said control line, whereby said flow direction valve is closed against filter downstream pressure by filter upstream pressure, and the water is directed through the first water path and said solar heater panels.

3,906,929

PROCESSES FOR REPRODUCTION OF CELLULAR BODIES

Lynn Lawrence Augspurger, 642 Fairfax, Birmingham, Mich. 48009

Continuation-in-part of Ser. No. 418,604, Nov. 23, 1973, Pat. No. 3,854,470, and a continuation-in-part of Ser. No. 444,022, Feb. 20, 1974, Pat. No. 3,866,598. This application Dec. 12, 1974, Ser. No. 532,253

Int. Cl.[2] A61K *17/00, 27/00*

U.S. Cl. 128—1 **26 Claims**

1. A process for embryo transplantation for increasing the number of progeny of female omnivorous and herbivorous hoofed mammal donors comprising,

inducing superovulation in a desired donor by administration of gonadotrophin,

fertilizing ova produced by said donor with a spermatazoa fraction of a desired sex, and

transplanting selected ova or individual ovum derived from said donor to a selected recipient at the time that the recipient is synchronized with the development of the transplanted fertilized ovum or ova such that the transplant is synchronized at the blastocyst stage in the recipient at the time that the recipient would normally implant an ovum of its own had the recipient been fertilized.

3,906,930

BLOOD TAKING DEVICE

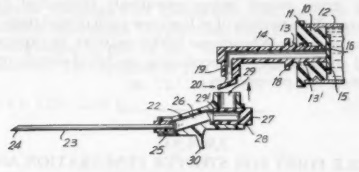
Dr. Luis A. Guerra, 257 Central Park West, New York, N.Y. 10024

Filed Mar. 23, 1973, Ser. No. 344,387

Int. Cl. A61b *5/14;* **A61m** *5/32*

U.S. Cl. 128—2 F **13 Claims**

1. An improvement in a blood-taking device for taking blood from a blood vessel, wherein said improvement comprises a cannula-containing portion and a container portion, said cannula-containing portion comprising a cannula having a sharp distal end and a proximal end, a support section having a passage therethrough, the distal end of said passage tightly receiving the proximal end of said cannula, first valve means seated in the proximal end of said passage for closing same, said support section having an aperture therein connecting with said passage, said first valve means normally closing the connection between said aperture and said passage, said container portion comprising an evacuable container having a moutn, a stopper in said mouth, tube means having a proximal



end passing through said stopper and a distal end removably connected with said aperture in said support section to form a tight connection between said tube means and said support section at said aperture therein, and operating means on the distal end of said tube means for opening said first valve means and thereby connecting said aperture with said passage when said tube means is connected to said support section, said stopper being affixed to said container for movement therewith relative to said tube means and fitting sufficiently tightly to said mouth to prevent flow of air therebetween.

3,906,931

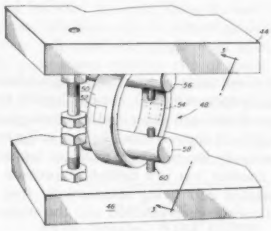
DEVICE FOR THE DETERMINATION AND THE AUTOMATIC REAL TIME COMPUTATION OF THE PARAMETERS OF MAN'S STABILITY OF STANCE

Yuriy V. Terekhov, P.S.C. Box 1351, Brooks AFB, Tex. 78235

Filed June 7, 1973, Ser. No. 368,033

Int. Cl. A61b *5/00, 5/10*

U.S. Cl. 128—2 N **3 Claims**



1. A system for determining a man's real-time stability of stance parameters, said system comprising:

a. upper platform means disposed substantially along an upper plane for supporting said man;

b. lower base means disposed substantially along a lower plane below said upper platform means;

c. at least three rings disposed in contact with said platform means and said base means with their axes generally parallel to said upper plane and said lower plane;

d. lower connecting means for anchoring lower peripheral portions of said rings to said base means;

e. upper connecting means for anchoring upper periperal portions of said rings to said platform means;

f. each of said lower connecting means includes a rod having opposed extremity portions and a medial portion and each of said upper connecting means includes a rod having opposed extremity portions of said rod of said lower connecting means being affixed to said lower base means,

said medial portion of said rod of said lower connecting means bearing against a lower portion of one of said rings, said opposed extremity portions of said rod of said upper connecting means being affixed to said upper platform means, said medial portion of said rod of said upper connecting means bearing against an upper portion of said one of said rings, the axes of said rod of said upper connecting means, said rod of said lower connecting means and said one of said rings being parallel to each other;

g. at least three electrical strain gauges, at least one each of said strain gauges being operatively connected to an intermediate portion of at least one each of said rings; and

h. at least one Wheatstone bridge network incorporating said strain gauges for producing electrical signals representing said parameters.

3,906,932

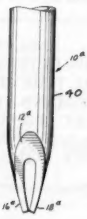
NEEDLE POINT FOR STOPPER PENETRATION AND METHOD OF MAKING IT

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,346

Int. Cl.[2] A61B *5/14;* **A67B** *7/24;* **B21D** *9/00*

U.S. Cl. 128—2 F **5 Claims**



1. A stopper penetrating needle including a tubular portion having a stopper penetrating end, the end having two beveled faces 180° apart from each other and in converging relationship defining a pair of opposed tips, the tips being bent toward one another whereby the points of each tip are substantially adjacent one another but not united to provide a stopper penetrating pointed end being substantially free of lateral deflection and coring when inserted into the stopper.

3,906,933

METHOD AND APPARATUS FOR DETERMINATION OF SKIN TYPE

Wladimir Tur, Mutschellen, and Eugen Wyler, Kusnacht, both of Switzerland, assignors to Lovida AG, Oberwil, Switzerland

Filed Apr. 5, 1974, Ser. No. 458,394

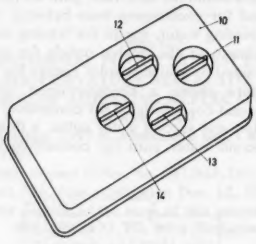
Claims priority, application Switzerland, Apr. 16, 1973, 5482/73

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 W **12 Claims**

1. A device for recording skin conditions for the determination of skin type on the basis of the sebum content of the skin, comprising

a printing stamp having a smooth working surface for application against the skin, said working surface comprising means for electrostatically attracting and retaining sebum and other accumulations from the skin to thereby provide an electrostatic sebum content imprint of the skin, said electrostatic attracting and retaining means consisting



of an electrostatically charged material with a surface tension of less than 30 dynes per centimeter.

3,906,934

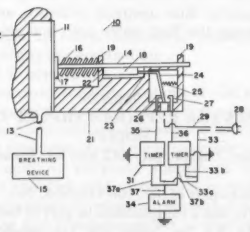
PRESSURE SENSOR-TIMER ALARM FOR PRESSURE SENSITIVE DEVICES

William H. Haverland, 4987 Rt. 2, Confier, Colo. 80433

Continuation-in-part of Ser. No. 362,276, May 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 152,385, June 11, 1971, abandoned. This application Aug. 7, 1974, Ser. No. 495,301

Int. Cl. A61b *5/00;* **A62b** *7/00*

U.S. Cl. 128—2 R **3 Claims**



1. A pressure sensor-timer alarm for use in mechanical breathing devices which comprise in combination, a diaphragm chamber mounted on a support and communicatively connected to a mechanical breathing device, a diaphragm mounted in the chamber, a ferro-magnetic metallic plunger mounted on the diaphragm and reciprocally mounted on the support, a permanent magnet magnetically and slidably mounted on the plunger, a pluality of stop means on the support restricting the reciprocal movement of the magnet, a switch means and a plurality of stationary contact means mounted on the support, the switch means in engagement with the magnet and movable between the contact means, a plurality of timers communicatively connected to the switch means and the contact means and an alarm communicatively connected to the timers.

3,906,935

MEDICAL FLUID DRAINAGE AND SAMPLING SYSTEM

David C. Raia, Arlington, Mass., and Brewster H. Staples, Pownal, Maine, assignors to G.A.R.D. Industries, Inc., Boston, Mass.

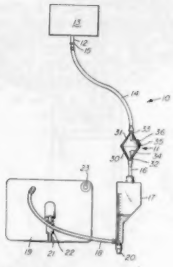
Filed June 29, 1973, Ser. No. 375,044

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 F **3 Claims**

1. In a medical fluid drainage system for conducting fluid from the body of a patient, said drainage system comprising a fluid collection vessel and a fluid collection tube, the tube

being connected at one end to a catheter insertable in the patient and to the vessel at another end, the improvement comprising, a wall defining a closed unitary sample chamber mounted intermediately in said collection tube between the catheter and the collection vessel, establishing an input section of the tube between the catheter and the sample chamber, the input section being connected to a first opening in the wall and the sample chamber also establishing an output section of the tube between the collection vessel and the sample chamber, the output section being connected to an output tubular



stem means extending through a second opening in the wall for collecting a sample in the chamber and terminating inside said chamber and spaced from said wall at its termination within the chamber,

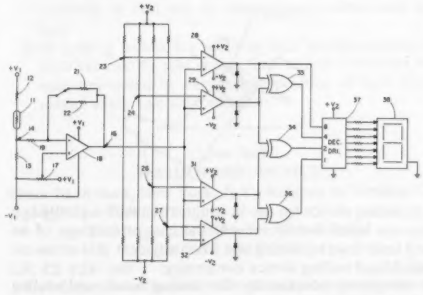
an elastomeric self-sealing seal means in the wall of said chamber constructed and located to receive a sterile hypodermic needle therethrough into communication with a collected sample and to maintain its seal upon withdrawal of such hypodermic needle whereby collection of the most recently drained fluid from a patient's body is permitted by sterile invasion of the system.

3,906,936

NASAL AIR FLOW DETECTION METHOD FOR SPEECH EVALUATION

Mutaz B. Habal, 3848 Knollton Rd., Indianapolis, Ind. 46208

Filed Feb. 15, 1974, Ser. No. 442,926
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 R **3 Claims**



1. A method in the area of speech evaluation for detecting the presence and extent of nasal air emissions of a subject during speech comprising the steps of:

positioning, within a path of nasal air flow of the subject, sensor means, including a first element sensitive to temperature, for presenting at an output an electrical characteristic dependent upon the temperature of the first element;

having the subject speak; and

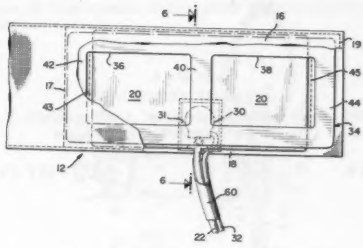
detecting relative values of the electrical characteristic of the sensor means which are produced by nasal air emissions of the subject during said speaking for the purpose of evaluating the nasal air flow of the subject indicated by the electrical characteristic at the output of the sensor means with regard to what is spoken by the subject.

3,906,937

BLOOD PRESSURE CUFF AND BLADDER AND APPARATUS EMBODYING THE SAME

Theodore Aronson, Fort Lauderdale, Fla., assignor to Para-Medical Instrument Corporation, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 300,507, Oct. 25, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 443,130
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 C **21 Claims**



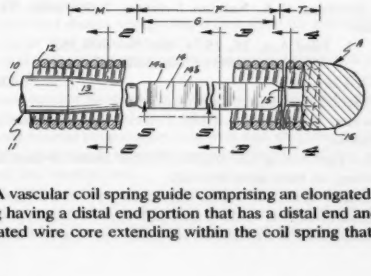
11. A blood-pressure cuff comprising an elongated non-elastic cover having a rectangularly shaped hollow inflatable portion having an outer wall and an inner wall and a fastening portion extending from the inflatable portion for fastening the cover with the inner wall of the inflatable portion applied about limb of the user, a rectangularly shaped inflatable bladder positioned within said hollow inflatable portion between inner facing surfaces of said inner and outer walls and having a single fluid inlet, inflating means connected to said fluid inlet to inflate the bladder, the latter being formed with a plurality of contiguous chambers each in communication with adjoining chambers and with said single fluid inlet, and a single component prestressed resilient clip of spiral shape loosely disposed within said inflatable portion between the bladder and the inner surface of the outer wall of the inflatable portion, said clip being substantially co-extensive in length and width with the length and width of said inflatable portion to impart its spiral shape to said cover and said bladder.

3,906,938

COIL SPRING WIRE GUIDE

John J. Fleischhacker, Minnetonka, Minn., assignor to Lake Region Manufacturing Company, Inc., Chaska, Minn.

Filed Sept. 3, 1974, Ser. No. 502,617
Int. Cl.² A61M *25/00*
U.S. Cl. 128—2 M **9 Claims**



1. A vascular coil spring guide comprising an elongated coil spring having a distal end portion that has a distal end and an elongated wire core extending within the coil spring that has

an elongated distal end portion within the coil spring distal end portion and a distal end, said wire core distal end portion having a plurality of undulations that are bent about axes that are generally perpendicular to the direction of elongation, said distal ends being fixedly secured to one another.

3,906,939

BLOOD PRESSURE MEASURING MEANS

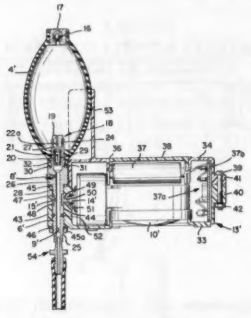
Theodore Aronson, Fort Lauderdale, Fla., assignor to Para-Medical Instrument Corporation, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 305,512, Nov. 10, 1972, abandoned. This application Jan. 10, 1974, Ser. No. 432,191

Claims priority, application United Kingdom, Aug. 23, 1973, 40076/73

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 G **10 Claims**



1. Blood pressure measuring apparatus comprising a cuff, an inflatable bladder within said cuff, pump means for inflating said bladder, a pressure gauge for indicating bladder pressure, a casing having a chamber housing said pressure gauge and an extension adjacent said chamber formed with a tubular bore, said casing having an aperture communicating said chamber with said tubular bore, said pressure gauge having an inlet fitting located in said casing aperture for fluid communication solely with said tubular bore, an elongated nozzle extending through said tubular bore and having a longitudinal passage with one end communicating with said pump means, a length of flexible tube interconnecting said bladder with the other end of said nozzle, a restricted opening formed in said nozzle communicating said longitudinal passage with said pressure gauge inlet fitting through an otherwise sealed transverse chamber which is substantially co-extensive with an intermediate portion of said tubular bore surrounding said nozzle and communicating with said casing aperture, and a bleed valve means to permit bleeding from said longitudinal passage located along the nozzle between said opening and said pump means end and being preset for bleeding at a predetermined rate.

3,906,940

FACIAL TREATMENT DEVICE

Sohji Kawada, 49-6, Nakano 5-chome, Nakano-ku, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,553

Int. Cl.[2] A61H *1/00*; **A61M** *1/00*

U.S. Cl. 128—40 **7 Claims**

1. A facial treatment comprising:

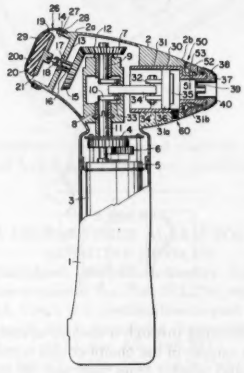
a. an easy to grip lower casing (**1**) incorporating a motor (**3**) therein;

b. an upper casing (**2**) angularly fitted aslant to said lower casing on both sides thereof;

c. a crank shaft (**10**) including a crank pin (**33**) disposed at substantially the center inside said upper casing (**2**) which, crank shaft is interposed rotatably for connection with said motor (**3**) and a reduction gear mechanism (**6**) and may be dismounted;

d. a massaging member (**19**) with an outer side for engaging facial skin and an inner side connected to one end of said upper casing (**2**) via said crank shaft;

e. a pair of bevel gears (**12**) engaging with each other and a universal joint, one of said bevel gears being connected to said crank shaft, the other being connected to said universal joint, said universal joint being connected to



said massaging member inner side which is mounted thereon, and capable of dismounting therefrom and of rotating while performing an oscillating motion;

f. a stepped cylinder in said upper casing (**2**) toward the other end thereof having therein a piston (**32**) in interlock with said crank pin (**33**) capable of reciprocation inside said cylinder so as to cause suction and a cap (**38**) having suction holes (**37**) fitted to the distal end (**38***b*) of said cylinder at the other end of said upper casing.

3,906,941

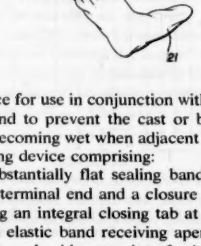
SEALING ITEM

Jerome Emerson Cook, Jr., 3204 East Lake Drive, Wonder Lake, Ill. 60097

Filed Nov. 30, 1973, Ser. No. 420,681

Int. Cl. A61f *13/00*

U.S. Cl. 128—82 **5 Claims**



1. A sealing device for use in conjunction with a plastic bag having one open end to prevent the cast or bandage of an injured limb from becoming wet when adjacent skin areas are cleansed, said sealing device comprising:

an elongated, substantially flat sealing band, said sealing band having a terminal end and a closure end, said closure end having an integral closing tab at the extremity thereof and an elastic band receiving aperture between said closing tab and said extremity of said closure end; and

a closed elastic band, one end of which is secured to said elastic band receiving aperture,

whereby when said sealing band is wrapped around the open end of said plastic bag into which the cast or ban-

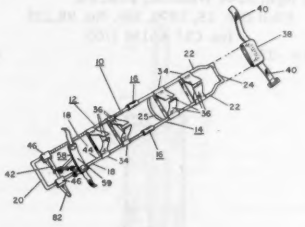
dage of an injured limb has been placed, said elastic band has been wound around said spirally wrapped sealing band and said closure end and then slipped over and around said closing tab, and said closing tab has been made to lie flush with said spirally wrapped sealing band, moisture is prevented from entering said open end of said plastic bag to thereby protect said cast or bandage from said moisture.

3,906,942

PORTABLE TRACTION SPLINT

Henry Oliver Lumb, Jr., 1050 Powell Dr., Riviera Beach, Fla. 33404, and Robert Richard Morrissey, 845 Fosteria Dr., Apt. 14, Lake Park, Fla. 33403

Filed Mar. 27, 1974, Ser. No. 455,265
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—84 C **5 Claims**



1. A portable traction splint comprising:

a pair of elongated side members and means for securing a limb therebetween, at least one of said side members including a ratchet track extending axially therealong,

traction means mounted on said side members, said traction means comprising a pair of blocks mounted one each on each of said side members for movement therealong, and a hollow bar extending transversely between said side members and secured to said blocks, one of said blocks having an opening therethrough in alignment with said bar and exposing said track,

a ratchet mechanism for locking said traction means against movement towards one end of said side members, said mechanism comprising a ratchet catch disposed within said hollow bar and biased to extend outwardly from one end thereof through said block opening and into engagement with said track, and means for retracting said catch inwardly of said bar for disengaging it from said track, and

limb lashing means for securing said traction means to a limb secured to said splint, limb length variations being accommodated by varying the position of said traction means along said side members.

3,906,943

ORTHOPEDIC DEVICE

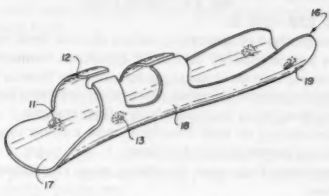
Elmer M. Arluck, New York, N.Y., assignor to Yardney Company, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,404
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—90 **35 Claims**

1. A formable orthopedic device comprising a plastic sheet member having one side covered with an insulating fabric layer which is affixed to said plastic sheet member;

said plastic sheet member being at least about 50 mils thick, and having a tensile strength at yield of between 2,000 and 10,000 psi, an elongation at yield of between 3 and 30%, a flexural strength of between 3,000 and 14,000 psi, a flexural modulus of between about 0.5×10^5 and 7×10^5 psi, a notched Izod of between 0.3 and 30 foot pounds per inch, a Rockwell hardness of between 15 on the R scale and 55 on the D scale, and a Vicat softening point of between 60° and 80°C;

said insulating fabric layer being at least about 10 mils thick, and is a fabric comprising fibers selected from the group



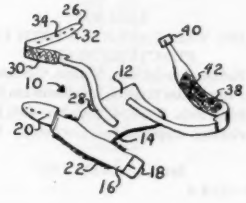
consisting of aramid fibers and high temperature cross-linked phenolformaldehyde fibers, which has a coefficient of heat transfer below about 2 cal/sec/cm²/cm/°C× 10^{-4}

3,906,944

SHOULDER HARNESS

Fred F. Christen, Rt. 1, Box 546, Raymond, Wash. 98577

Filed Oct. 3, 1973, Ser. No. 402,992
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **6 Claims**



1. A shoulder harness comprising:

a. a pad having a shoulder portion and an upper arm portion;

b. said pad being flexible and supple;

c. a first means connecting with said pad for attaching said upper arm portion to an arm of a wearer;

d. a second means connecting with said pad for positioning said shoulder portion over the shoulder of the wearer;

e. said second means comprising a strap capable of passing across the chest, around the side and under the other arm and across the back of the wearer;

f. said second means upon being positioned on the wearer of the shoulder harness forcing said pad to bear on the wearer in the area of the deltoideus muscle and in the area of the subscapularis muscle and in the area of the supraspinatus muscle and with said strap means being in the area of the supraspinatus muscle to assist in holding together the ball-and-socket joint of the upper arm and the shoulder;

g. said first means comprising a first strap for encircling the upper arm of the wearer;

h. said second means comprising a second strap and a third strap;

i. said second strap and said third strap adapted to encircle the chest, side and back of the wearer;

j. said second strap connecting with said shoulder portion in the area which is adapted to be over the ball and socket of the wearer; and,

k. said third strap connecting with said shoulder portion in the area which is adapted to be between the ball and socket of the wearer and the neck of the wearer.

3,906,945

ENDOTHERMAL CARBON DIOXIDE ABSORPTION

Loyal G. Netteland, East Aurora, and Clifford E. Heintz, Buffalo, both of N.Y., assignors to A-T-O Inc., Willoughby, Ohio

Filed Apr. 29, 1974, Ser. No. 464,738

Int. Cl.[2] A62B *19/00*

U.S. Cl. 128—191 R 6 Claims

1. The method of absorbing carbon dioxide from respiratory gases in a recirculatory breathing apparatus comprising:

a. forming a recirculatory gas stream flow from a breathing zone to a carbon dioxide absorption zone and back to said breathing zone in a circulatory flow system;

b. introducing to said breathing zone carbon dioxide containing respiratory exhalations;

c. removing from said breathing zone respiratory exhalations;

d. causing said exhalations to flow in said recirculating gas stream flow;

e. in said carbon dioxide absorption zone, causing recirculating gas stream to pass through a first chamber containing lithium hydroxide and immediately thereafter through a second chamber containing hydrated molecular sieve containing about 40 to 60 moles, per mole of said sieve, of water, causing said carbon dioxide to react with said lithium hydroxide at least in part by the reaction

$$LiOH + CO_2 \overset{H_2O}{\rightleftarrows} LiHCO_3.$$

3,906,946

INDWELLING VEIN CATHETER WITH CONCENTRIC PUNCTURE NEEDLE

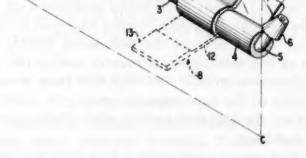
Cai Gustav Rabbe Nordström, Mainz, Germany, assignor to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

Filed Feb. 5, 1974, Ser. No. 440,134

Claims priority, application Germany, Feb. 7, 1973, 2305896

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—214.4 5 Claims



1. An indwelling vein catheter assembly comprising a catheter fitting, a catheter attached to and extending forwardly from said catheter fitting, a puncture needle holder attached to the rearward end of said catheter fitting, a puncture needle extending forwardly from said needle holder and concentrically through said catheter fitting and said catheter, and flexible, laterally extending wing elements attached to said catheter fitting, each of said wing elements comprising a relatively thick portion at the end thereof away from said catheter fitting and said relatively thick portion of said wing elements tapering off into a relatively thin portion, each of said thin portions being tangentially joined to the underside of said catheter fitting, said wing elements being adapted for symmetrically folding around opposite sides of said catheter fitting with said relatively thin portions snugly folded around said catheter fitting and with said relatively thick portions forming a gripping means for guiding said catheter assembly during insertion into a vein; said gripping means being in a plane which is at an angle of 30° to 60° with respect to a plane defined by the longitudinal axis of the puncture needle and the point of the puncture needle; and said thin portions being tangentially joined to the underside of said catheter fitting at a point which is substantially diametrically opposite to said thick portions of said wing elements when said wing elements are symmetrically folded around opposite sides of said catheter fitting.

3,906,947

SYRINGE

Harold S. Cloyd, 3244 Willis St., Erie, Pa.

Filed Dec. 15, 1970, Ser. No. 98,225

Int. Cl.[2] A61M *1/00*

U.S. Ci. 128—237 6 Claims

1. A syringe comprising a barrel closed fluid tight at one end and open at the other end, and a single piece of flexible plastic which forms the seal to the barrel required for shipping the syringe assembled and filled with the fluid to be dispensed and constitutes a cannula, piston and plunger,

said cannula having a fluid receiving end presented to the closed end of the barrel and a fluid discharging end extending out through the open end of the barrel,

said plunger having one end outside the open end of the barrel and the other end inside the barrel,

said piston having an end wall at the other end of the plunger integral with said fluid receiving end of the cannula and a peripheral flange extending from said end wall back toward the open end of the barrel and an annular flange having its inner edge integral with said peripheral flange, said flange diverging from said peripheral flange toward the closed end of the barrel at an acute angle and having sliding contact with the bore of the barrel,

said seal to the barrel required for shipping the syringe assembled and filled with the fluid to be dispensed resulting from the outside diameter of the outer edge of said flange being greater than the inside diameter of the bore of the vial and said flange being stiff enough so the deflection of the flange by static engagement of the outer edge of the flange and the bore results in adequate sealing pressure between the outer edge of the flange and the bore of the barrel to provide and maintain a leak proof

seal under static conditions so that the syringe can be shipped assembled and filled with the fluid to be dispensed, the essential stiffness of the flange and sealing pressure under static conditions being obtained when said flange is thick and narrow and has a thick non feathered outer edge of outside diameter greater than the bore of the barrel,

and removable means on and closing the fluid discharge end of the cannula.

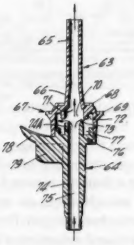
3,906,948
RECTAL APPLICATOR

Alexander A. Vass, 309 E. 87th St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 307,469, Nov. 17, 1972, abandoned. This application May 15, 1974, Ser. No. 470,121

Int. Cl.² A61M *3/00*

U.S. Cl. 128—245 **9 Claims**



1. An applicator for admininstering a fluid into the intestinal tract per rectum, comprising a tubular nozzle section and a tubular stem section joined to each other to form an integral structure, an enlargement formed at the junction of said nozzle and stem sections and extending normally to the axis of said integral structure, and a chamber within said enlargement to receive contrast fluid therein, and means on the proximal face of said enlargement adapted to be applied against the perianal area of a body into the rectum of which said nozzle is inserted to seal the anal opening thereof, said stem section having a posterior extension for providing indirect sealing of said opening.

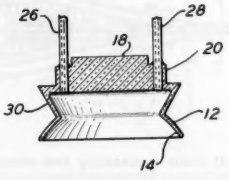
3,906,949
CORNEAL BATH

Monte G. Holland, New Orleans, La., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 249,814, May 3, 1972, abandoned. This application June 3, 1974, Ser. No. 475,706

Int. Cl. A61m *7/00*

U.S. Cl. 128—249 **2 Claims**



1. A corneal bath comprising:

a lens

a substantially cylindrical annular lens holder, wherein the outer circumference of the lens is sealed into the inner circumference of said annular lens holder, a cup shaped corneal eye contact portion, and

means for defining a corneal bath portion comprising a connecting and separating portion between said eye contact portion and said lens holder portion and at least two access means in said lens holder communicating with said bath portion for introducing liquid and gaseous fluids into and removing said fluids from both portions of said corneal bath.

3,906,950
INHALING DEVICE FOR POWDERED MEDICAMENTS

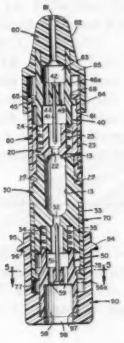
Salvatore Cocozza, Milan, Italy, assignor to I.S.F. S.p.A., Milan, Italy

Filed Apr. 2, 1974, Ser. No. 457,270

Claims priority, application Italy, Apr. 4, 1973, 22576/73; June 22, 1973, 25698/73

Int. Cl.² A61M *13/00, 15/08*

U.S. Cl. 128—266 **22 Claims**



1. An inhaling device, for delivering powdered substances in aerated form from a pierced capsule, comprising a pump and an inhaler, said inhaler comprising:

A. a relatively fixed central element formed by two connectable components and defining a cavity for reception of said capsule, and

B. a pair of relatively moveable needle holder elements including piercing means mounted therein, which are:

1. telescopically slidable within said connectable components against the action of a pair of return springs and in the path of movement of air through said inhaler,

2. disposed in mutually opposed relationship and in straddling relationship to said capsule, and

3. constituting a means for piercing said capsule when said springs are compressed by slidably moving said needle holder elements toward each other.

3,906,951
STOMAL DEVICE INCLUDING MEANS TO PROLONG ATTACHMENT OF FLANGE

James Ling Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 5, 1974, Ser. No. 494,781

Int. Cl.² A61F *5/44*

U.S. Cl. 128—283 **13 Claims**

1. A stomal device comprising an adhesive member, a rigid flange means including a continuous side wall, outwardly extending bottom wall perpendicular to said side wall and an upper lip, said flange means affixed to one side of said adhesive member by an adhesive bond between said bottom wall and said adhesive member, both said adhesive member and

said bottom wall having a centrally located opening to permit the device to encircle a stoma, a quantity of hydrocolloid containing ointment or non-aqueous paste located interior of said flange side wall and supported by said adhesive member, a rigid or semi-rigid covering disc having a centrally located opening sized and shaped so as to snugly fit in the space between said flange side wall and said stoma with said covering disk opening in line with said adhesive member opening, whereby movement of said covering disc toward said adhesive member will force a portion of the hydrocolloid containing ointment or paste to fill the space between the stoma and said covering disc.

3,906,952

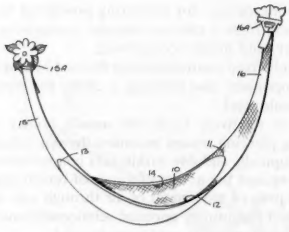
ANATOMICALLY-CONTOURED SANITARY NAPKIN

Sophie Zamist, 3010 Grand Concourse, Bronx, N.Y. 10458

Filed Nov. 27, 1970, Ser. No. 93,135

Int. Cl. A61f *13/16*

U.S. Cl. 128—290 R **4 Claims**



1. A disposable anatomicallyconforming sanitary napkin comprising:

A. a backing formed of impermeable film, said backing being constituted by a spoon-bowl shaped well provided with flat marginal lips and whose opposite ends merge into flat, tapered extensions for connecting said napkin to body patches,

B. a pad of absorptive material received within said well and conforming to the shape thereof,

C. a porous facing marginally secured to the lips of said well and to said tapered extensions to hold said pad in said well, and

D. a pair of adhesive patches attachable to front and rear points on the body of the wearer, said patches being provided with grippers for adjustable linkage to said extensions.

3,906,953

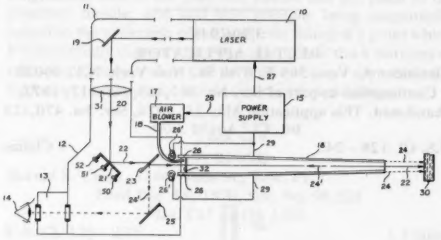
ENDOSCOPIC SURGICAL LASER SYSTEM

Robert A. Wallace, Wayland, and Jan Pejchar, Maynard, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 23, 1974, Ser. No. 472,785

Int. Cl.² A61B *17/36*

U.S. Cl. 128—303.1 **6 Claims**



1. An endoscopic surgical laser system comprising in combination: a laser device, means for energizing said device at a power frequency selected from a range of power frequencies including DC thereby generating a possibly continuous laser beam, an endoscope attachment, means for operatively applying said beam to said attachment, an endoscope for exiting said beam from said attachment and for performing surgery therewith, fiber optic means mounted within said endoscope for continuously illuminating with visible light a site being impinged upon by said beam, said endoscope including means for permitting reflected visible light from said site to reach said endoscope attachment, observer eyepiece means operatively associated with said endoscope attachment for receiving said reflected visible light, and means for controlling said beam.

3,906,954

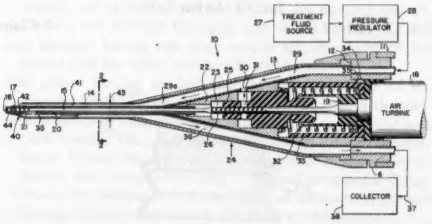
OPHTHALMIC LIQUIFACTION PUMP

Edward F. Baehr, Berea; Jack B. Esgar, N. Olmsted, and William J. McGannon, Lakewood, all of Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Sept. 14, 1973, Ser. No. 397,478

Int. Cl.² A61B *17/32*; **A61M** *7/00*

U.S. Cl. 128—305 **20 Claims**



1. A surgical tissue macerating and removing instrument comprising:

a cylindrical tube open at least at one end and having at least one aperture in its wall;

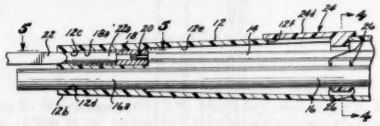
a rod disposed in said tube for rotation therein, said rod being formed into a first archimedes screw portion at one end, said first archimedes screw portion extending between said one end of said tube and said aperture in said tube;

a cutting edge being disposed at said one end of said rod;
drive means for rotating said rod at a speed sufficient to cause a pumping action from said open end of said tube toward said aperture; and
first counterflow means for directing a liquid into the space between said rod and said tube in a direction providing a first counterflow toward said aperture and said open end of said tube.

3,906,955
SURGICAL CAUTERIZING TOOL HAVING SUCTION MEANS

Richard R. Roberts, The Barn Trailer Pk., Rt. 1, Box 321, Red Oak, Tex. 75154

Filed May 6, 1974, Ser. No. 467,611
Int. Cl.[2] A61B *17/36;* **A61M** *1/00*
U.S. Cl. 128—303.17 **4 Claims**

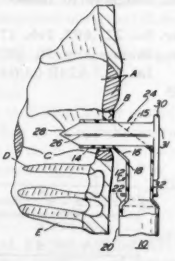


1. A medical tool comprising in combination,
an elongated body formed with first and second through openings and a cavity in a side wall thereof,
cauterizing means comprising an electrical conductor within said first through opening and a cauterizing blade extending from one end of said first opening and connected in circuit with said conductor,
a tube slideably positioned within said second through opening and adapted to be connected to a vacuum source, and
a slider extending through said cavity in said body and fastened to said tube to be manually operated exteriorly of said body to extend and retract said tube to and from adjacent said cauterizing blade.

3,906,956
CRICOTHYROSTOMY INSTRUMENT

Max I. Gilbert, 9612 N. Military Trl., Palm Beach Gardens, Fla. 33410

Filed July 3, 1974, Ser. No. 483,727
Int. Cl.[2] A61B *17/32;* **A61M** *16/00*
U.S. Cl. 128—305.3 **12 Claims**



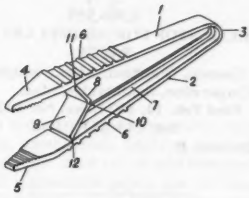
1. A laryngeal-tracheal instrument comprising:
a tube of generally L-shaped configuration having tubular components joining to form a vertex region and including an access opening through structure of said vertex region; and
a cutting instrument, a portion of which is slidably engageable through said access opening and through one of said tubular components whereby said cutting instrument is insertable through said tube to penetrate a membrane in the laryngeal-tracheal region of a patient.

9. The method of conducting a cricothyrostomy on a patient comprising the steps of:
inserting a cutting instrument through a first opening of a cricothyrostomy tube and advancing the instrument to project outwardly of a second opening in the cricothyrostomy tube;
penetrating the cricothyroid membrane with the cutting instrument;
inserting a first portion of the cricothyrostomy tube through said membrane;
withdrawing the cutting instrument; and
further inserting said cricothyrostomy tube whereby said first and second openings of said cricothyrostomy tube are positioned in a patient's trachea.

3,906,957
FORCEPS

David Frederick Weston, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 11, 1974, Ser. No. 450,195
Claims priority, application United Kingdom, Apr. 24, 1973, 19278/73; Nov. 14, 1973, 52875/73
Int. Cl.[2] A61B *17/28, 17/00;* **B25B** *9/02*
U.S. Cl. 128—321 **6 Claims**



1. Forceps comprising
a. a pair of arms each having a first and a second end,
b. a jaw located at the first end of each arm,
c. an intermediate section joining the second ends of each arm remote from said jaws for permitting relative movement of said arms in a plane passing through the length of each arm, and
d. flexible connector means attached between the two said arms at points adjacent said jaws, being bowed away from said jaws toward said intermediate section and moving in the space between said arms about said points of attachment.

3,906,958
CATHETER ADAPTER HAVING FILTERED AIR VENT

Kenneth Howard Knox, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

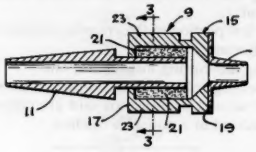
Filed June 21, 1974, Ser. No. 481,597
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 R **8 Claims**

1. An integral tubular adapter for use in a urinary drainage system, said adapter comprising first and second tubes joined solely by a tubular sleeve,
said tubular sleeve having first and second endwalls each with an aperture therethrough, and a third aperture disposed in its sidewall and covered by a bacteria filtering material through which air can pass but body fluids cannot, said third aperture terminating a predetermined distance axially from said first endwall,
said first tube having one end thereof continuously open to air passed through said third aperture and extending into said sleeve through said aperture of said first endwall a distance at least substantially equal to said predetermined

distance from said first endwall at which said third aperture terminates, said first tube having its outer end adapted for engagement with a urinary drainage catheter; and

said second tube having one end in communication with said aperture of said second endwall of said sleeve and the other end thereof adapted for engagement with the proximal end of a drainage tube joined at its distal end to a urine collection container,

whereby a consecutive flow path through said catheter, adapter and drainage tube into said container is provided remote from said filtered third aperture, which third aperture is adapted to continuously admit filtered, atmospheric air into said flow path in the vicinity of said proximal end of said drainage tube.

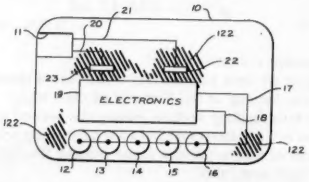


3,906,959

LIQUID LEAK STOP FOR AN IMPLANTABLE HEART PACER

Robert L. Cannon, Waltham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 14, 1974, Ser. No. 442,536
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 P **3 Claims**



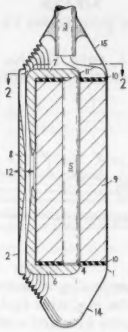
1. An implantable heart pacer for providing stimulation to the heart of a patient, said pacer comprising terminal means for connection to said patient's heart, pulse generator means for providing stimulation impulses, means comprising two conductor leads for extending said impulses to said terminal means, means for detecting the beating action of said patient's heart, means responsive to operation of said detecting means for controlling said pulse generator means, battery means for energizing said pulse generator means and said detecting means, epoxy insulation encapsulating said extending means, said battery means, said detecting means, said controlling means, and said pulse generator means, and incompressible liquid leak stop means constructed from at least glass-epoxy laminate adheringly connected to said extending means and bonded with said insulation for preventing flow of liquid from said terminal means towards said pulse generator means along said extending means, and wherein said incompressible liquid leak stop means is formed as two separate shields with an aperture through each of said shields, the inside shield surface and adjacent shield periphery of each of said apertures having deposited thereon a conductive metal, each of said apertures being adapted to receive one of said leads, and means for sealing said conductive metal around each of said leads in a manner to prevent said flow of liquid through each of said apertures, the remaining surface of each of said shields being bonded to said insulation whereby said flow of liquid is prevented from flowing around each of said shields.

3,906,960

MEDICAL ENERGY CONVERTER

Siegfried R. Lehr, 8 Munich 60, Negrellist 100, Germany

Filed Feb. 25, 1974, Ser. No. 448,730
Claims priority, application Germany, Feb. 27, 1973, 2309749
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 PG **3 Claims**



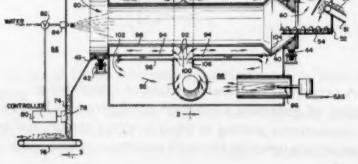
1. A medical energy converter implanted in a vessel, a heart ventricle or in muscle comprising: an elongate, thin housing with one side forming an integral, resilient membrane having corrugations around the membrane area and having a predetermined spring constant; a reluctance generator having a magnetic circuit comprising a core with spaced yokes, an armature mounted on said membrane in spaced relation to said yokes and a magnet whose force balances said spring force such that at increasing ambient pressure, the armature moves closer to the yokes and finally latches and at decreasing ambient pressure, the armature is released, jumping outwards; a coil for converting reluctance changes to electric energy and means for applying said energy to the body, the housing being filled with gas and sealed.

3,906,961

ROTARY TOBACCO DRYER

Lorne A. Rowell, Lachine, and James H. Cartmell, Preville, both of Canada, assignors to Imasco Limited, Montreal, Canada

Division of Ser. No. 227,693, Feb. 17, 1972, Pat. No. 3,785,765. This application Aug. 30, 1973, Ser. No. 393,197
Int. Cl.² A24B *03/04*
U.S. Cl. 131—135 **4 Claims**



1. A tobacco dryer comprising a rotating substantially cylindrical drum in which the tobacco is dried; said drum having a

first end and a second end; means for introducing tobacco at said first end and means for removing tobacco at said second end; means for introducing process air into said drum at said second end and extracting said process air from said drum at said first end so that said process air travels in a direction within said drum opposite to that of said tobacco to pick up and remove from the drum, moisture released from the tobacco; heating means for maintaining the temperature of heating air; means for circulating said heating air at a velocity between 500 fpm and 3,500 fpm over the outer surface of said drum to thereby achieve high heat conductance through said drum, a controllable water spray nozzle for injecting a water spray into said drum at said second end; a sensing means operatively associated with the tobacco leaving said dryer, said sensing means having an output signal which is proportional to the moisture content of said tobacco; and a controller responsive to said output signal for controlling said controllable water spray nozzle so as to maintain the moisture content of said tobacco leaving said dryer at a predetermined constant level.

3,906,962

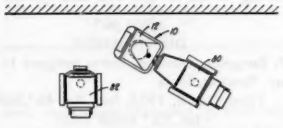
METHOD OF SHAMPOOING HAIR

Bobby L. Strickland, 10913 N. McKinley, and Doyle E. Simpson, 1200 N.W. 104th St., both of Oklahoma City, Okla. 73114

Division of Ser. No. 389,368, Aug. 17, 1973, Pat. No. 3,849,806. This application Aug. 1, 1974, Ser. No. 493,674

Int. Cl.[2] A45D *19/00*

U.S. Cl. 132—7 **2 Claims**



1. A method of shampooing two individuals' hair while seated in chairs of the reclining type using a single rotatable shampoo bowl assembly comprising the steps of:

a. positioning said chairs on opposite sides of said rotatable shampoo bowl assembly so that each of said chairs can be reclined and the individual seated therein positioned to have his hair shampooed using said shampoo bowl assembly.

b. rotating said shampoo bowl assembly into alignment with one of said chairs;

c. reclining said chair;

d. shampooing the individual's hair seated in said chair;

e. returning said chair to its upright position; and

f. repeating steps (b) through (e) on the second chair and the individual seated therein.

3,906,963

DENTAL FLOSS APPLICATOR

Richard A. Jenkins, Indianapolis, and Jennifer J. Trueblood, now by change of name, Jennifer Jean Hays, South Bend, both of Ind., assignors to Jen Tru Inc., Indianapolis, Ind.

Filed Oct. 18, 1973, Ser. No. 407,430

Int. Cl.[2] A61C *15/00*

U.S. Cl. 132—92 A **31 Claims**

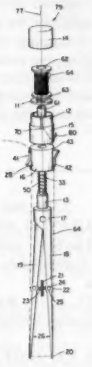
1. A dental floss applicator comprising:

a. a prong assembly including

1. a first prong having a distal end which includes means for guiding dental floss,

2. a second prong having a distal end which includes means for guiding dental floss,

3. width maintaining means connecting to said first prong and said second prong for maintaining any one of several fixed distances between the distal end of said first prong and the distal end of said second prong, said width maintaining means having an adjusting means for permitting the fixed distance maintained by said width maintaining means to be readily changed to another of the several fixed distances, and



b. floss tension and supply means connecting to said prong assembly for continuously applying tension to floss guided between the distal end of said first prong and the distal end of said second prong and for automatically providing a temporary increase of at least 20% in length of floss between the distal end of said first prong and the distal end of said second prong while force is applied to the floss.

3,906,964

COIN WRAPPING APPARATUS

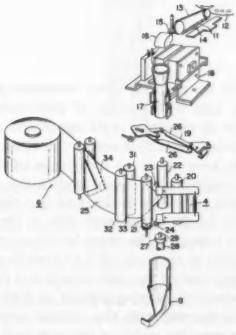
Masatoshi Ushio, and Hirokuni Matono, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jan. 3, 1974, Ser. No. 430,517

Claims priority, application Japan, Jan. 12, 1973, 48-6417

Int. Cl.[2] G07D *9/06*

U.S. Cl. 133—1 A **2 Claims**



1. In a coin wrapping apparatus of the type including a wrapping means comprising a plurality of wrapping rolls for

wrapping a piece of wrapping paper around the peripheral surface of a stack of coins and a wrapping paper feeding means for feeding the wrapping paper to said wrapping mechanism, the improvement which comprises: a wrapping paper detecting means operatively positioned for detecting the feeding of wrapping paper by the wrapping paper feeding means; a first drive means operatively coupled to said wrapping rolls for reciprocally driving them so they are alternately in contact with and separated from the peripheral surface of the coin stack; a second drive means operatively coupled to said wrapping rolls for rotating them; and means operatively coupling said detecting means and first and second drive means for operating said first and second drive means when feeding of the wrapping paper is detected by said detecting means at a preset time during the wrapping operation, thereby to continue operation of the wrapping means, and, when an absence of the wrapping paper is detected at said preset time, for continuing rotation of said wrapping rolls but halting reciprocative motion of said rolls until the wrapping paper is normally fed.

3,906,965

COIN SEPARATOR AND STACKER

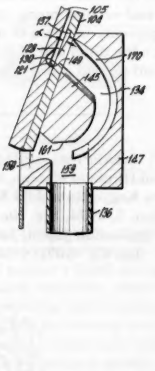
Gijsbertus Cornelius Luyben, and Abraham Marinus De Wilde, both of Delft, Netherlands, assignors to Mars, Incorporated, McLean, Va.

Filed Nov. 21, 1974, Ser. No. 525,841

Claims priority, application United Kingdom, Nov. 22, 1973, 54317/73

Int. Cl.[2] G07F *3/04*

U.S. Cl. 133—1 A **33 Claims**



1. Apparatus for stacking coins comprising a substantially vertical chute into which coins of predetermined diameter topple through an entrance at its upper end and from which they leave moving edge first across the open upper end of a coin tube at its lower end, the inner edge of the upper end of the coin tube opposite the lower end of the chute being exposed when the coin tube is filled to less than capacity and being obscured by the uppermost coin in the tube when the tube is filled to capacity, the chute having a concave rear wall to guide the coins to the coin tube so that they slide edge first across the upper end of the coin tube and a front wall having an initial, downwardly sloping surface to guide the coins from the entrance to the rear wall, the vertical contours of the rear wall varying across the width of the rear wall so as to impart rolling motion to a coin sliding down the chute in contact with the rear wall before the coin reaches the upper end of the coin tube.

3,906,966

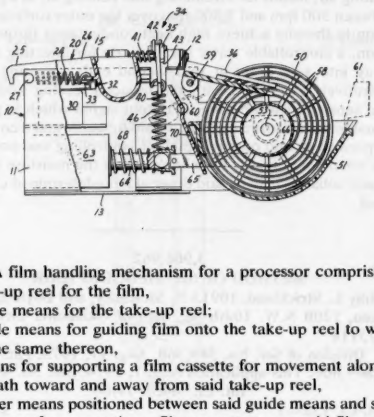
FILM HANDLING DEVICE

Gerald E. Drake, and Donald J. Mitchell, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 2, 1974, Ser. No. 429,540

Int. Cl.[2] G03D *3/00;* **B65H** *35/04*

U.S. Cl. 134—46 **8 Claims**



1. A film handling mechanism for a processor comprising:

a take-up reel for the film,

drive means for the take-up reel;

guide means for guiding film onto the take-up reel to wind the same thereon,

means for supporting a film cassette for movement along a path toward and away from said take-up reel,

cutter means positioned between said guide means and said means for supporting a film cassette to cut said film, and actuating means to actuate said cutter means in response to movement of said means for supporting said film cassette being moved toward said take-up reel.

3,906,967

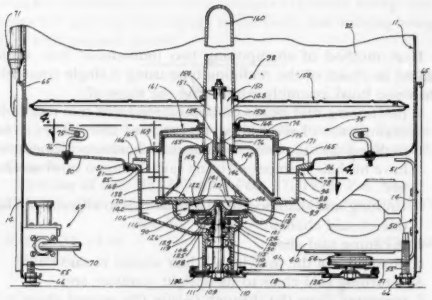
DISHWASHER

Richard P. Bergeson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed May 8, 1974, Ser. No. 467,868

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—104 **15 Claims**



1. A combination sump and pump assembly for a dishwasher including a container means defining a washing chamber and having a bottom wall with a generally central opening therein, the combination comprising: first housing means effectively fixed to said bottom wall generally aligned with and depending from said opening for defining a sump chamber disposed generally below and in fluid communication with said washing chamber; generally annular fine mesh filter means disposed in said sump chamber and forming a first sump portion from said filter means and a second sump portion downstream from said filter means; a cover attached to said first housing means separating said second sump portion from said washing chamber and defining a fluid strainer between said washing chamber and said first sump portion; fluid

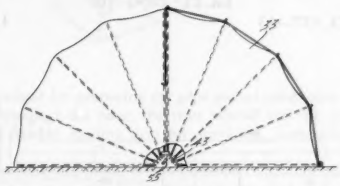
distribution means including means within said sump chamber for defining a fluid distribution conduit extending upwardly therethrough; second housing means defining a recirculation pump cavity disposed generally below said first housing means and having an inlet in fluid communication with said second sump portion and an outlet in fluid communication with said fluid distribution conduit; third housing means disposed generally below said first housing means and defining a drain pump cavity having an inlet in fluid communication with said first sump portion and an outlet in fluid communication with an external drain; a first impeller operable in said recirculation pump cavity for effecting flow of fluid from said first sump portion through said filter means and said second sump portion into said recirculation pump cavity for pumping to said fluid distribution conduit; a second impeller operable in said drain pump cavity for effecting flow of fluid and particles therein from said first sump portion to said drain pump cavity and to said external drain; and means for supporting said first and second impellers for rotation within said pump cavities.

3,906,968

TENT WITH ARCHED BOWS

John O. Black, 18094 Parkside, Detroit, Mich. 48221

Filed Sept. 23, 1974, Ser. No. 508,414
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—4 R **6 Claims**



1. In a tent, oppositely disposed ground engaging side plates, arcuate bows having their ends pivoted to the side plates to be arched therebetween, fabric means spanning the area between the bows when the bows are extended to form the tent, two central bows movable to adjacent vertical positions, gears mounted on an end of said central bows by which they are moved to raised adjacent position, the movement of one or both of the central bows to raised position causes the bows outwardly thereof to pivot upwardly therewith due to the cloth connection between the bows to cover the area within the two outermost bows which rest upon the ground.

3,906,969

PORTABLE AWNING

Donald W. Myers, 11000 S.W. Boones Ferry Rd., Portland, Oreg. 97219

Filed Apr. 29, 1974, Ser. No. 465,287
Int. Cl.[2] E04F *10/06*
U.S. Cl. 135—5 A **4 Claims**

1. A portable awning, comprising:

a. an elongated housing having an elongated opening through its side,

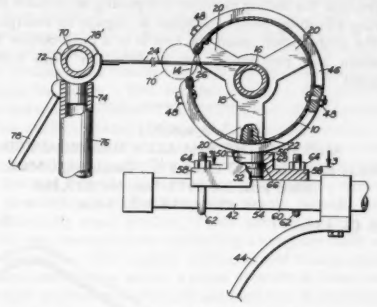
b. a pair of split rings encircling the housing at longitudinally spaced positions, the spacing between the ends of each of the split rings registering with the elongated opening in the housing,

c. a cylindrical post extending from each ring and having an annular groove therein, a base member having a bore receiving the post rotatably therein, and pin means on the base member extending tangentially into said bore and annular groove for retaining the post in the bore against longitudinal displacement while affording axial rotation of the post relative to the base member,

d. means engaging the base member for securing the latter to a support,

e. an elongated rotary shaft mounted in the housing,

f. an elongated sheet of flexible awning material having an inner transverse edge secured to the shaft for winding the material upon and unwinding it from the shaft, the outer transverse edge of the material extending outwardly



through the elongated opening in the housing for movement of the material between a retracted position wound upon the shaft and an extended position projecting from the housing, and

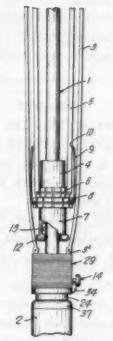
g. lock means releasably interengaging the housing and shaft for securing the latter releasably against rotation, whereby to secure the awning material in diverse conditions of extension from the housing.

3,906,970

SELF-OPENING UMBRELLA

Kazo Saito, and Nobutoshi Kida, both of Osaka, Japan, assignors to Telesco Brophey Limited, Montreal, Canada

Filed June 4, 1973, Ser. No. 366,274
Int. Cl. A45b *25/16*
U.S. Cl. 135—22 **6 Claims**



1. A self-opening umbrella comprising a stick, a handle at one end of the stick, a crown at the other end of the stick, at least one runner slidable on the stick, dome ribs hinged to the crown, and stretcher members hinged to the runner and to the dome ribs respectively for supporting the dome ribs when the umbrella is in an open position; energy-storing means for loading the components of the umbrella to force the unbrella components to move to an umbrella open position when the umbrella is closed and the runner is adjacent the handle; a locking pawl pivotally mounted in the hollow stick with a locking head protruding radially from the stick and adapted to

engage a seat provided in the runner; releasable push-button means associated with the locking pawl, whereby when the push-button means is depressed laterally, it will force the locking pawl to pivot inwardly of the stick and disengage the runner, a sliding member adapted for limited axial movement whereby in one position, it engages and locks the push-button means and in a second position, it is disengaged from the push-button means allowing the push-button means to be depressed, the sliding member comprising an annular element having a built-up portion adapted to engage an enlarged head of the push-button when the ring is in a push-button locking position and preventing the push-button from being depressed.

3,906,971

AIDS FOR THE VISUALLY HANDICAPPED

Murray Burnstine, 132 Oxford St., Cambridge, Mass. 02140

Filed Feb. 26, 1971, Ser. No. 119,215
Int. Cl.[2] A45B *3/00, 9/04*
U.S. Cl. 135—47 **8 Claims**

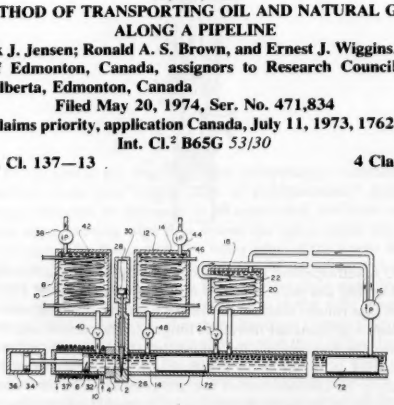
1. An aid for the visually handicapped comprising buoyant means adapted for mounting on the terminal portion of a cane shaft, said buoyant means comprising: (A) two longitudinally mating halves defining together a form stable buoyant structure having a longitudinal bore therethrough, said bore being adapted to engage a cane shaft at the terminal portion thereof and said buoyant structure having sufficient buoyancy to convey a perceptible tactile stimulus through a cane shaft when brought into contact with a standing body of water, and (B) means to urge said mating halves of said buoyant structure together so as to bind said halves to the cane shaft.

3,906,972

METHOD OF TRANSPORTING OIL AND NATURAL GAS ALONG A PIPELINE

Erik J. Jensen; Ronald A. S. Brown, and Ernest J. Wiggins, all of Edmonton, Canada, assignors to Research Council of Alberta, Edmonton, Canada

Filed May 20, 1974, Ser. No. 471,834
Claims priority, application Canada, July 11, 1973, 176210
Int. Cl.[2] B65G *53/30*
U.S. Cl. 137—13 **4 Claims**



1. A method of transporting oil and natural gas along a pipeline, comprising:

a. pumping the natural gas along a pipeline in a liquefied state,

b. freezing by a controlled rate of introduction of discrete, molded, liquid bodies of the oil into the liquefied natural gas, the oil into bodies having a frozen outer skin to retain the molded shape, and of sufficient size for single row distribution only along the pipeline,

c. conveying the said discrete, substantially frozen bodies in the frozen condition in single row distribution along at least a portion of the said pipeline by the said liquefied natural gas being pumped therealong,

d. removing the thus conveyed discrete, substantially frozen bodies from the said liquefied natural gas in the pipeline, and

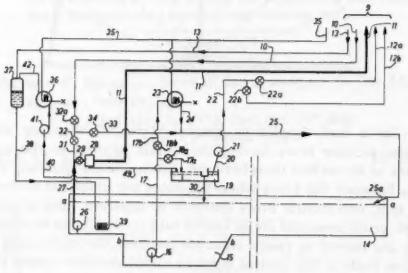
e. melting the separated discrete, substantially frozen bodies for storage in liquid form.

3,906,973

METHOD FOR UNDERGROUND STORAGE OF HEAVY FLOWABLE SUBSTANCES

Louis-Gabriel de Jerphanion, and Etienne Schlumberger, both of Paris, France, assignors to Societe a Responsabilite Limitee: Societe Francaise de Stockage Geologique "GEOSTOCK", Paris, France

Filed July 8, 1974, Ser. No. 486,697
Claims priority, application France, July 10, 1973, 73.25301
Int. Cl.[2] B65G *5/00*
U.S. Cl. 137—13 **11 Claims**

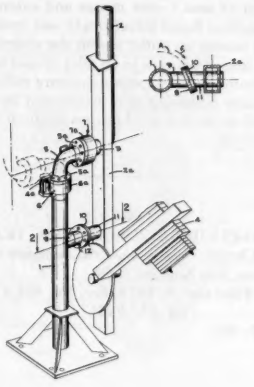


1. A method for underground storage of heavy flowable substances solidified at normal storage temperatures in a storage facility including a series of parallel, underground galleries, closed at one of their ends, the open ends of the galleries opening into a common central channel, the bottoms of the galleries being substantially in the same horizontal plane; comprising the following steps for putting the substance in storage, including introducing the heavy substance into the galleries and letting said heavy substance thus stored in the galleries solidify therein; and comprising the following steps for taking the stored solidified substance out of storage, including introducing a hot fluid through the ends of the galleries closed during the introduction of the heavy liquid substance, circulating said hot fluid in contact with the solidified stored substance in the galleries towards the common central channel and transferring heat to the solidified stored substance thereby progressively liquefying at least part of the solidified substance and entraining it with the circulating hot fluid, whereby the then liquefied substance may be pumped and taken out of the storage facility.

3,906,974
MARINE LOADING ARM

Daniel Marcel Chevallier, Sens, France, assignor to Societe Technique et Commercial d'Installations Industrielles "Luceat", Sens, France

Filed June 6, 1974, Ser. No. 476,828
Int. Cl.[2] F16L *27/00*
U.S. Cl. 137—15 **9 Claims**



7. A method for preparing the pipe swivel joints that pivotally interconnect the riser, the riser elbow, and the inboard arm of a marine loading arm for servicing, comprising the steps of

a. positioning the inboard arm in an erect attitude wherein a portion thereof extends alongside the riser,

b. rigidly yet releasably securing the inboard arm to the riser by auxiliary support means attached to both said inboard arm and said riser at a location spaced from the riser elbow,

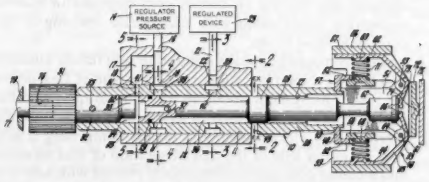
c. transferring to the auxiliary support means the weight imposed on the riser elbow by the inboard arm, and

d. disconnecting the riser elbow from the adjacent pipe swivel joints.

3,906,975
HYDRAULIC PULSED GOVERNOR

James T. Craig, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 8, 1974, Ser. No. 449,361
Int. Cl.[2] G05D *13/38*
U.S. Cl. 137—56 **8 Claims**

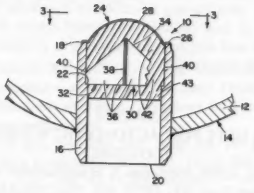


1. In a governor assembly; governor means having housing means having fluid pressure supply passage means and governor pressure passage means, drive means, weight means rotatably mounted on said housing means and rotatably driven by said drive means at governor speed for providing a speed bias force proportional to said governor speed, bias chamber means for providing a pressure bias force proportional to fluid pressure in said bias chamber means, branch passage means connecting said governor pressure passage means to said bias chamber means, governor valve means having relatively moving valve portions and being connected to said fluid pressure supply passage means, said governor pressure passage means, said weight means and said bias chamber means providing oscillatory regulating movement of said valve portions under the influence of said speed bias force and said pressure bias force acting in opposite directions for receiving fluid pressure supply from said fluid pressure supply means and supply regulated governor pressure proportional to governor speed to said governor pressure passage means and through said branch passage means to said biasing chamber means; and said governor means including a first member having a first circular surface and a second member having a second circular surface in sealing surface contact with said first circular surface at their interface operatively drive connected to said drive means for rotation relative to said first member and relative rotation of said first and second circular surfaces, pulse supply passage means connecting said fluid pressure supply passage to a circumferentially small portion of one circular surface and pulse delivery passage means connecting a small circumferential portion of the other circular surface to said biasing chamber means operative to supply a pulse pressure at least once during each relative revolution of said members to impose on said oscillating regulating movement of said valve portions a further oscillating pulsing movement to provide lower moving valve friction between said valve portions.

3,906,976
THERMALLY ACTIVATED BURST DISC

Gary Dean Nohr, and Francis Richard Bollenbach, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 21, 1973, Ser. No. 343,511
Int. Cl.[2] F16K *17/38*
U.S. Cl. 137—68 **4 Claims**



1. A burst disc unit comprising,

a tubular housing adapted for mounting in a container, and having an inner end and an outer end,

a rupturable disc element sealingly secured to the housing at the inner end of the latter and being dome-shaped and extending beyond the inner end of the housing,

knife blade means having a plurality of blade elements in the housing with cutting edges presented to the disc element and positioned for engagement by the disc element, and puncturing of the latter, in response to flexure of the central portion of the disc element through the inner end of the tubular housing, and

solid eutectic material in the housing and extending between the blade elements, and substantially embedding the knife blade means, and filling the inner end portion of the housing and bonded to the housing and retaining the knife blade means in position in the housing, and further extending inwardly of the housing to a position at least as far as the inner extremity of the knife blade means and thereby preventing the disc element from engaging the knife blade means,

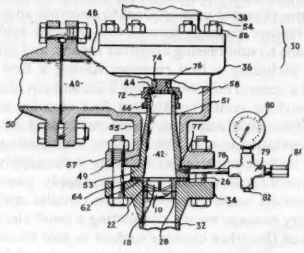
the eutectic material being meltable at a predetermined temperature enabling pressure against the disc element to move it against the knife blade means and puncturing it.

3,906,977

REVERSE ACTING SAFETY RELIEF DEVICE

Stanley E. Summers, Woodland Hill, and Werner M. Dudzik, Downey, both of Calif., assignors to Black, Sivalls & Bryson, Inc., Tulsa, Okla.

Filed Nov. 30, 1970, Ser. No. 93,691
Int. Cl. F16k 17/40
U.S. Cl. 137—71 15 Claims



1. A reverse acting, frangible relief device adapted for mounting as a unit within piping at a flanged piping joint which comprises an assembly of a frangible reverse acting diaphragm having a central dome portion and an annular flange with a transition therebetween, retaining means supporting said annular flange comprising a first sleeve of sufficient diameter for insertion into the bore of said piping with the annular flange of said diaphragm secured thereto, said sleeve having a thin, annular mounting flange projecting outwardly therefrom with a sufficient diameter for engagement between mating flanges of said piping joint, knife blade means supported by said first sleeve in axial proximity to the concave side of said diaphragm and separated therefrom by said first sleeve a sufficient distance whereby said diaphragm will be impaled by said knife blade means only when said diaphragm is caused to snap over center and reverse its position, and a second sleeve, also having a sufficient diameter for insertion into the bore of said piping, positioned about the upstream, convex side of said diaphragm whereby to protect it during its installation and handling.

3,906,978

CONTROL UNIT FOR AUTOMATIC WATERING OF FLOWERS

Reinhard Kurz, 6369 Nidderau 3, Hauptstrasse 6, Germany

Filed Aug. 21, 1973, Ser. No. 390,226
Claims priority, application Germany, Aug. 22, 1972, 2241215
Int. Cl.² A01G 25/00
U.S. Cl. 137—78 8 Claims

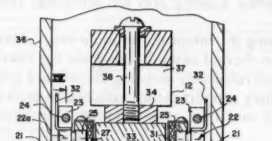
1. A device for controllably suppling a liquid to a porous medium to maintain a given degree of humidification therein which comprises a feeder means having an inlet for receiving liquid to be supplied to the porous medium and capillary means disposed for contact with said medium to diffuse into said medium the liquid received, said capillary means being responsive to the absorption characteristic of the medium to establish a pressure differential in accordance with the degree of humidification of the medium whereby the pressure of the liquid at the inlet of the feeder means tends to establish an outflow of liquid therefrom into the medium; and regulator means having an enclosed chamber, a first conduit communicating with a source of liquid and extending into said chamber to deliver liquid therein, and a second conduit communicating with the inlet of said feeder means and extending into said chamber to deliver liquid therefrom to said feeder means, said first conduit having an outlet within the chamber positioned in elevation spaced relation to an inlet of said second conduit within the chamber to establish a pressure differential opposing and counter-balancing that established by said capillary means at said given degree of porous medium humidification to be maintained.

3,906,979

ELECTRO-FLUIDIC/HYDROFLUIDIC TRANSDUCER

Donald W. Chapin, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 9, 1973, Ser. No. 404,470
Int. Cl.² F15C 3/14
U.S. Cl. 137—83 8 Claims



1. An electro-fluidic transducer comprising:

a. a fluidic element having a nozzle opening receiving fluid from a pressure source and forming a fluid beam, said element also having an output port disposed in spaced registering relationship with said nozzle opening to receive said fluid beam;

b. an electromagnetic means secured to said fluidic element and having a member supported by a pair of flex pivots for rotary movement about an axis substantially parallel to that of the beam formed by said nozzle and at one side thereof, said electro-magnetic means comprising a side pole on either side of the axis of rotation of said member and a center pole piece substantially coaxial with said axis and having a coil encircling said center pole piece with the axis of the coil at right angles to the axis of the pivots, said member being moved in response to signals applied to said coil; and

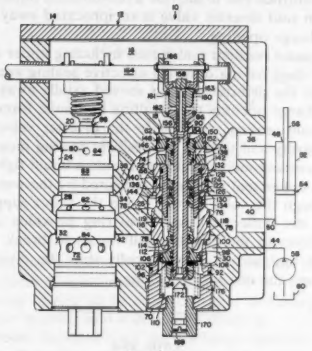
c. a pin supported by said members and extending into the space between said nozzle opening and output port, rotary movement of said member serving to swing said pin across the path of said beam to vary the portion thereof flowing through said output port.

3,906,980

DIRECTION CONTROL VALVE EMBODYING A SLEEVE-LIKE PRESSURE EQUALIZING VALVE ELEMENT

Paul Edmund Hanser, Moline, Ill., and William Lee Snyder, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 4, 1974, Ser. No. 457,961
Int. Cl.[2] F15B 13/042
U.S. Cl. 137—106 3 Claims



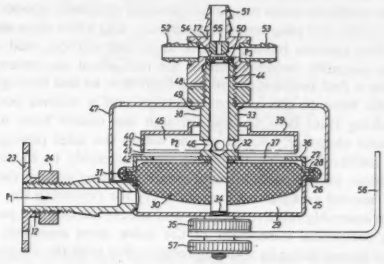
1. A hydraulic direction control valve for controlling the flow of fluid to and away from an extensible and retractable hydraulic motor, comprising: a valve bore means; serially arranged first, second, third and fourth fluid passage means connected to said valve bore means at axially spaced locations and being respectively adapted for connection to a reservoir, to a first motor work port, to a second motor work port and to a source of fluid pressure; said bore means including first and second valve engageable surface means respectively located between the first and second passage means and between the third and fourth passage means; a valve stem axially shiftably mounted in said valve bore means and having first and second valve means mounted thereon for movement therewith between a neutral position wherein the first and second valve means are in sealing engagement with said first and second valve engageable surface means to respectively present the flow of fluid between the first and second passage means and between the third and fourth passage means, and an operative position wherein the first and second valve means are respectively unseated from the first and second valve engageable surface means for respectively establishing fluid communication between the first and second passage means and between the third and fourth passage means; partition means in said bore means between said second and third passage means for blocking fluid communication therebetween and including a third valve means in the form of an annular sleeve-like member axially shiftably mounted on said valve stem and slidably engaged with the bore means for movement between a normal position wherein opposite first and second ends thereof are respectively in fluid communication with said second and third fluid passage means and a closed position wherein said first end remains in fluid communication with the second fluid passage means while surface means adjacent the second end are in blocking relationship to the third passage means; and said third valve means being dimensioned and mounted such that equal fluid pressures acting on the opposite ends of the third valve means will develop balancing pressure forces on the third valve means whereby when the pressure at said second fluid passage is greater than the pressure at said third fluid passage, the third valve means will shift to said closed position.

3,906,981

DEVICE FOR ADJUSTING A PNEUMATICALLY OPERATED OPERATING ELEMENT

Kurt Baasch Jensen, Sonderborg; Knud Vagn Valbjorn, Nordborg, and Poul Christian Dyhr-Mikkelsen, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Mar. 13, 1974, Ser. No. 450,836
Claims priority, application Germany, Mar. 17, 1973, 2313341
Int. Cl.[2] H01M 6/00
U.S. Cl. 137—115 4 Claims



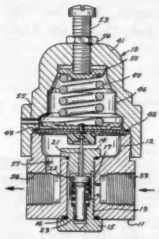
1. A pneumatic pressure regulating assembly comprising a chamber housing having a top portion with at least one hole therein, a hollow spindle member having an inlet opening in fluid communication with the interior thereof, a dish shaped member having a central opening and being slidably mounted on said spindle member above said inlet opening, said dish shaped member having a flange engageable with said top portion and in surrounding relation to said housing hole, said dish shaped member being raisable by air flowing from said housing through said hole thereof to allow a portion of said air to be blown off and a portion of said air to enter said inlet opening of said spindle member.

3,906,982

PRESSURE REGULATOR ASSEMBLY

Joseph F. Fleischhacker, Minnetonka, and Thomas W. Hruby, Minneapolis, both of Minn., assignors to Tescom Corporation, Minneapolis, Minn.

Division of Ser. No. 284,253, Aug. 28, 1972, Pat. No. 3,812,877. This application May 20, 1974, Ser. No. 471,569
Int. Cl.[2] G05D 16/06
U.S. Cl. 137—116.5 8 Claims



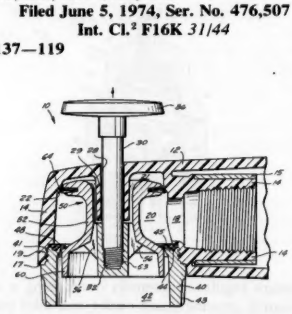
1. A pressure regulator assembly comprising a valve body having a control chamber, and outlet and inlet passageways opening to the control chamber in spaced relationship to one another, a bonnet mounted on the valve body and having a bonnet chamber opening toward the control chamber, a diaphragm mounted by the bonnet and valve body for separating the control chamber from the bonnet chamber, first means mounted by the bonnet and extending within the bonnet

chamber for resiliently urging the diaphragm toward the control chamber, a nozzle mounted by the body, extending within the inlet passageway and having a bore extending therethrough to permit passage of fluid through the inlet passageway to the control chamber, a plug mounted by the body, extending into the inlet passageway remote from the nozzle and having a plug bore, a valve stem assembly extending within the inlet passageway and through the nozzle bore, said valve stem assembly having a first elongated portion extended through the nozzle bore and into the control chamber; and a second elongated end portion extending into the plug bore, said first assembly portion and second end portion being of cross sectional areas to provide annular clearance spaces with the nozzle and plug bores respectively, said valve stem assembly first portion having a valve stem end portion, said valve stem assembly being mounted for reciprócal movement between a first position permitting fluid flow to and through the nozzle bore to the control chamber and a second position blocking fluid flow to and through the nozzle bore to the control chamber, second means within the inlet passageway for resiliently urging the valve stem assembly to its second position, and third and fourth means abutting against the first and second end portions respectively for centering the valve stem assembly relative the plug and nozzle bores while permitting reciprocal movement of the valve stem assembly, said third means being in abutting relationship with the diaphragm and including a resilient centering disc having a peripheral edge portion mounted between the diaphragm and valve body and extending across the control chamber, a central portion having a wall defining a recess for centering the first portion relative the nozzle bore, said valve stem end portion extending into said recess in close fitting relationship with the wall defining the recess, and a boss extending toward the diaphragm to space a surrounding portion of the diaphragm from the rest of the centering disc, and an aperture spaced from the boss to place the part of the control chamber on the opposite side of the centering disc from the diaphragm in fluid communication with the space between the diaphragm and centering disc, said diaphragm having an aperture extending therethrough that opens to the space surrounded by said boss, and being movable relative the boss between a first position blocking fluid flow through said disc aperture to said diaphragm paerture and a position for providing a fluid flow path from the disc aperture, through the diaphragm aperture and to the bonnet chamber, said bonnet having a vent aperture opening to the bonnet chamber.

3,906,983
DIVERTER VALVE

Richard G. Parkison, Somerville, N.J., assignor to American Standard, Inc., New York, N.Y.

Filed June 5, 1974, Ser. No. 476,507
Int. Cl.² F16K *31/44*
U.S. Cl. 137—119 **19 Claims**



1. In combination, a diverter valve and spout having a downturned spout end,

said spout having spaced water inlet and water discharge openings and a discharge passage formed in the downturned spout end and positioned between said spaced openings,

said diverter valve housed within the downturned spout end and including a valve body in the form of a hollow spool to provide an auxiliary path for water to pass downwardly therethrough when the diverter valve is moved toward the discharge opening,

said diverter valve mounted for reciprocation within the downturned spout end,

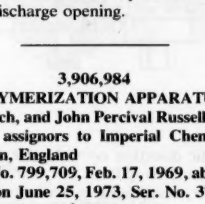
spaced resilient seal means associated with said valve body and the surfaces defining the discharge passage within the downturned end to provide a substantially liquid tight seal when said diverter valve is reciprocated away from the discharge opening,

said spaced resilient seal means including upper and lower seal rings having differing effective sealing areas so that when the diverter valve is moved axially away from the discharge opening the resulting hydraulic forces exerted on said sealing areas cause the diverter valve to move upwardly and to hold the resilient sealing means against the corresponding seats to provide a liquid tight seal and said upper seal ring being deflected by the water passing through the valve so that when the water supply is shut off, the deflected upper seal ring provides a force in addition to the gravitational forces to break the water tight seal and to automatically shift the diverter valve toward the discharge opening.

3,906,984
POLYMERIZATION APPARATUS

John Theodore Rich, and John Percival Russell, both of Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 799,709, Feb. 17, 1969, abandoned. This application June 25, 1973, Ser. No. 372,935
Int. Cl.² B01D *57/00*
U.S. Cl. 137—171 **5 Claims**



1. In a continuous polymerization apparatus for producing a flow of molten polymer and steam associated therewith and for separating the steam from the molten polymer, said apparatus including a vessel containing a melt pool of polymer and an open-ended conduit through which the molten polymer flows in a path along the wall and out of the conduit into the pool while the steam passes through the center of the conduit, the improvement comprising a downwardly facing expanding outlet device at the open end of said conduit and between said open end and the surface of said pool, the bottom edge of said expanding outlet device being downwardly sloping from a highest point to a lowest point and being curved inwardly and upwardly to form a channel which has an outlet at said lowest point, the dimensions and shape of said outlet device being chosen such that the polymer can flow via the channel into the pool while the steam can escape upwardly with freefall of the molten polymer through the gaseous fluid being substantially prevented.

3,906,985
VALVE

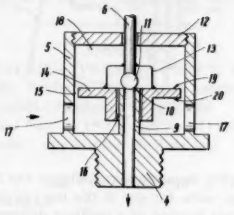
Werner Foller, Heiligenrode, Germany, assignor to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft Bremen, Bremen, Germany

Filed Nov. 30, 1973, Ser. No. 420,477

Claims priority, application Germany, Dec. 2, 1972, 2259079

Int. Cl.[2] F17T *1/20*

U.S. Cl. 137—192 **4 Claims**



1. A float controllable steam trap, valve and the like responsive to a level of condensate comprising:

a housing having an internal chamber including an input supply opening and a discharge opening;

a cyclinder disposed over the discharge opening within the internal chamber of said housing, said cylinder having at least one radial input opening communicative to the housing member, and a nozzle defining a valve seat and communicative with the discharge opening;

a piston movably disposed on said nozzle and defining a pressure chamber within said cylinder;

locking means connected to said piston for closing contact with the valve seat of said nozzle, said piston defining a first throttle opening between the walls of the cylinder and the piston, and a second throttle opening between said piston and the valve seat of said nozzle, the pressure chamber being communicative through said first and second throttle openings to the radial input openings of said cylinder in both the opened and closed positions of the valve seat;

a float disposed with the housing chamber; and

means physically connecting said piston and locking means and extending through said cylinder and coupled to said float, wherein when an inlet pressure is applied to the inlet supply opening of said housing, the pressure is applied to one side of said piston to load the piston in a valve-opening direction, and applied to the opposite side of said piston through said throttle openings so as to load said piston in a valve-closing position, so that when the condensate fills the housing chamber and raises said float and locking means from said valve seat, the condensate will be drained through said throttle opening into the discharge opening of said housing.

3,906,986
CHECK VALVE FOR BEER DISTRIBUTING SYSTEM

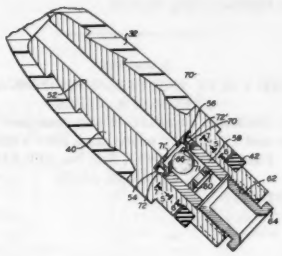
David Zurit, Tenafly, N.J., and Frank Sciara, Floral Park, N.Y., assignors to Vending Components, Inc., Hackensack, N.J.

Filed Feb. 4, 1974, Ser. No. 439,311

Int. Cl.[2] B67D *1/72;* **F16K** *15/04*

U.S. Cl. 137—212 **9 Claims**

1. In a distribution system for beer and the like, a fitting having two passages therein, including a passage for flow of liquid from a container, another passage for supplying gas under pressure to the container, a shoulder along the gas passage at a location where the diameter of the gas passage decreases, a check valve in the gas passage, the check valve including a valve element and a seat against which the valve element closes in response to gas flow in a direction away from the container, said shoulder having an inside diameter smaller than the diameter of the valve element, the seat including an elastomer sleeve having circumferential inwardly extending resilient lips at both ends thereof, retaining means, of larger diameter than the valve element and the lips, for holding the sleeve against the shoulder, the first of the resilient lips being in position to receive a front face of the valve element, the



yielding of said first lip increasing the inside diameter of the opening through the seat to receive the front face of the valve element further into the opening surrounded by the resilient lip, when the valve element is closed by light back pressure of the gas, and the second of the resilient lips being in position to be clamped against the juncture of the shoulder with the reduced diameter portion of the gas passage by said valve element when there is substantially higher back pressure against the valve element.

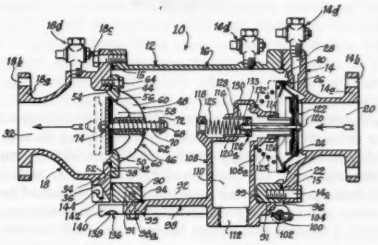
3,906,987
SWING OPEN CROSS-CONNECTION VALVE

Calvin Rushforth, Andover, and Sebastian David Tine, Lawrence, both of Mass., assignors to Watts Regulator Company, Lawrence, Mass.

Filed Mar. 13, 1974, Ser. No. 450,594

Int. Cl. F16k *17/04*

U.S. Cl. 137—218 **9 Claims**



1. In a backflow preventer valve system that includes spaced upstream and downstream valve means arranged to normally prevent a backflow, and a backflow discharge means located between said upstream and downstream valve means, the improvement of a field serviceable backflow preventer comprising, in combination:

an elongated valve casing having upstream and downstream ends and longitudinal walls, fixed flow-through structure operatively associated respectively with the upstream and downstream valving means adjacent the respective ends of the casing, an access opening through a longitudinal wall of the valve casing, an access door for normally closing the access opening, the backflow discharge means including a tubular discharge passageway means, movable discharge valving means controlling flow communi-

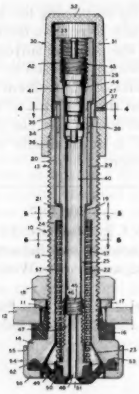
cation between the interior of the valve casing and the tubular discharge passageway means, the upstream valving means including movable valving elements, said discharge valving means and said movable valving elements being carried by said tubular discharge passageway means which, in turn, is carried by said access door, and the size of said access opening permitting the discharge valving means and movable valving elements to be swung to a position outwardly of the confines of the valve casing to permit field servicing thereof.

3,906,988

COMBINED VALVE AND PRESSURE INDICATOR FOR PNEUMATIC TIRES

Charles P. Mottram, Stratford, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,334
Int. Cl.[2] F16K *15/20*
U.S. Cl. 137—227 **7 Claims**



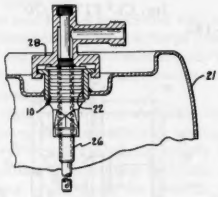
1. A pressure indicating device for pneumatic tires comprising a valve stem having an axial bore extending therethrough, an elongated body of greater length than said stem mounted within said bore for reciprocatory movement, said tubular body being provided with an intermediate portion of enlarged diameter and an enlarged head portion on the outer extremity thereof, a flexible diaphragm having a centrally located aperture mounted upon the inner extremity of said tubular body, sealing means connecting the peripheral portion of said diaphragm to the adjacent extremity of said stem, resilient means normally urging said tubular body and associated diaphragm to an inward position, a tubular spacing sleeve mounted upon said intermediate portion, and at least two visual signal means constituted by annular bands mounted upon said intermediate portion and retained in adjusted spaced relationship between said spacing sleeve and said enlarged head portion, said tubular body being movable outwardly against the tension of said resilient means to expose said visual signals when fluid pressure within a pneumatic tire against said diaphragm reaches a predetermined level, any drop in fluid pressure within said tire below said predetermined level permitting said resilient means to move said tubular body inwardly of said valve stem a sufficient distance to conceal at least one of said visual signal means.

3,906,989

RESILIENT MATERIAL TAP VALVE WITH MAGNETIC CLOSURE ASSIST

Kay R. Lamb, 1105 Ridge Ave., Rockford, Ill. 61103

Filed Dec. 6, 1973, Ser. No. 410,981
Int. Cl.[2] B65D *83/00*
U.S. Cl. 137—320 **7 Claims**



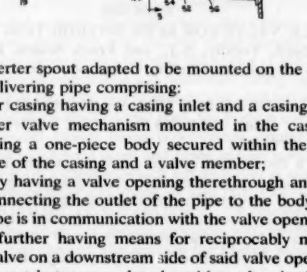
1. A keg tapping apparatus including a tap head having a draft tube, a tap valve for use in the tap opening of the keg comprising a body formed of a resilient deformable material having a passage extending therethrough and opening at one end of the body and dimensioned to allow insertion of the draft tube therethrough, the body having means on its outer periphery for sealingly engaging a tap opening in a keg and an inwardly tapered portion at the other end terminating in a pair of thin flexible lips, the lips having opposed faces engageable to form a liquid tight closure for said passage and being separable upon insertion of the draft tube through the passage and engageable with the outer wall of the draft tube to form a seal therewith, and magnetic means on each of the lips of said pair of lips for magnetically attracting said lips into face-to-face engagement, said magnetic means including permanent magnet means on at least one lip of said pair polarized to magnetically attract the magnetic means on the other lip of said pair, said draft tube being formed of a non-magnetic material so that the magnetic means on the lips are not magnetically attractive to the draft tube whereby to minimize resistance to insertion and removal of the draft tube from the tap valve.

3,906,990

DIVERTER SPOUT

Merritt J. Nelson, Sparta, Mich., assignor to Zin-Plas Corporation, Grand Rapids, Mich.

Filed May 13, 1974, Ser. No. 469,313
Int. Cl.[2] F16L *5/00*
U.S. Cl. 137—359 **10 Claims**



1. A diverter spout adapted to be mounted on the outlet of a liquid delivering pipe comprising:
a tubular casing having a casing inlet and a casing outlet;
a diverter valve mechanism mounted in the casing and including a one-piece body secured within the interior surface of the casing and a valve member;
said body having a valve opening therethrough and means for connecting the outlet of the pipe to the body so that the pipe is in communication with the valve opening, said body further having means for reciprocably mounting said valve on a downstream side of said valve opening for movement between a closed position wherein the valve

member covers the valve opening, and an open position, wherein the valve opening is open;

said valve member including a pressure chamber and a sealing ring means disposed within the pressure chamber so as to surround the valve outlet in seating engagement therewith when the valve member is in the closed position to block water flow therethrough when pressurized water is introduced into the pressure chamber; and

a valve stem having an inner end attached to the valve member and extending through an opening in the casing to an outer end outside the casing, said valve stem being movable so as to open and close the valve member.

3,906,991

HYDRAULIC LOWERING CHECK VALVE

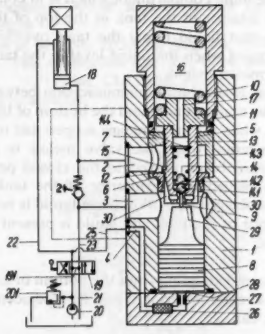
Hubert Häussler, Neuheim, Switzerland, assignor to Beringer-Hydraulik GmbH., Neuheim, Switzerland

Filed Nov. 1, 1973, Ser. No. 411,917

Claims priority, application Switzerland, Nov. 9, 1972, 16364/72

Int. Cl.² F16K *1/00*

U.S. Cl. 137—630.13 **5 Claims**



1. A hydraulic brake check valve comprising: a housing having an inlet for connection with a consumer and an outlet, first piston means having a substantially constant diameter throughout the length thereof and being arranged in said housing and movable to a closing position in which said first piston means blocks connection between said inlet and said outlet, spring means urging said first piston means into said closing position, a passage connecting said inlet with one side of said piston to urge said piston into said closing position when said inlet is under fluid pressure, said passage extending axially of said first piston means and having a cross-section steadily decreasing in the direction opposite to said closing direction, non-return valve means in said first piston means and connected to said passage, second piston means in said housing and being provided with means for engaging said non-return valve means, the effective area of said non-return valve means being substantially less than that of said second piston means, said first piston means being provided with axially extending grooves, spaced around the periphery thereof, the cross-section of said grooves increasing in a direction towards said second piston means, said second piston means having means for engaging said first piston means, whereby said second piston means is adapted to open said non-return valve means against the fluid pressure prevailing in said passage to thereby provide a connection between said inlet and said outlet, and whereby the cross-section of the connection between said inlet and said outlet gradually increases upon movement of said first piston means from its closing position upon engagement by said second piston means.

3,906,992

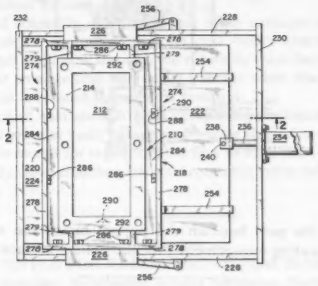
SEALED, EASILY CLEANABLE GATE VALVE

John Meredith Leach, P.O. Box 341, Port Jefferson, N.Y. 11777

Filed July 2, 1974, Ser. No. 485,108

Int. Cl.² F16K *3/14*

U.S. Cl. 137—315 **3 Claims**



1. A quikly cleanable and maintainable flow control gate valve comprising a homogenous body having a throughway opening therein for passage of the material being controlled through said valve body, a wall extending along but spaced from said body, tie-walls extending between said wall and and said body to support said wall and forming therewith a compartment open in its entire area both top and bottom, said wall and body having parallel and aligned slots extending therethrough which form a slideway into said throughway, a valve plate slidable in said slideway and across said compartment and throughway, a wear resistant and sealing packing in said compartment and in contact with said plate on one side thereof, a quickly removable closure plate for closing siad compartment which is separate from any other part of the valve and freely accessible, quick release fasteners for retaining said closure plate in said compartment, and a compressible resilient material interposed between said closure plate and said wear resistant packing to press said packing against said valve plate under controlled sealing pressure, whereby said compartment can be cleared completely for thorough cleaning of all movement related areas and parts replacement where required in a minimum of time.

3,906,993

DUAL DIRECTION FLOATING VALVE SEAT

Cecil E. Adams, and Leo H. Dillon, both of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

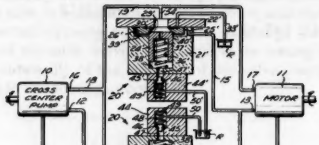
Filed Oct. 16, 1974, Ser. No. 515,271

Int. Cl.² F16K *1/42, 25/00*

U.S. Cl. 137—540 **6 Claims**

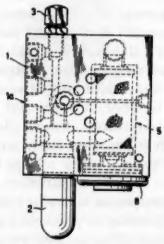
1. A pressure control valve comprising a valve body having a cavity, a valve seat freely movable within the cavity and having a bore and a bottom surface which engages a mating surface on the valve body, a port in said valve body mating surface, a drain groove in one of the surfaces which is connected to a low pressure source when the surfaces are engaged, a poppet, and means biasing the poppet into engagement with the valve seat to center the valve seat relative to the

poppet with the bore aligned with the port, said engagement being along a line overlying the drain groove so that pressure



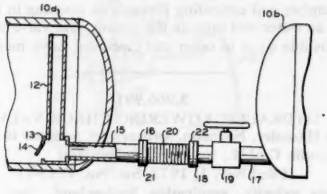
fluid in the port beneath the poppet biases the valve seat toward seating engagement with the mating surface.

3,906,994
HYDRAULIC SYSTEM
Otmar Schön, Scheidterberg, Germany, assignor to Hydac, Gesellschaft fur Hydraulik-Zubehor, Sulzbach, Germany
Filed Apr. 24, 1974, Ser. No. 463,779
Claims priority, application Germany, Apr. 27, 1973, 2321312
Int. Cl.[2] B01D *35/00*
U.S. Cl. 137—544 **4 Claims**



1. In a hydraulic system of the type having a control unit for controlling the operative functions of said system, and wherein the control unit includes a housing having an internal passage through which the hydraulic fluid must flow and a plurality of function-controlling elements in the housing and acting upon the fluid flow and whose operations can be deleteriously influenced by contaminants in the hydraulic fluid, the improvement comprising a chamber formed in said housing and having an inlet and an outlet communicating with said passage upstream of said function-controlling elements, and said housing having an opening communicating with said chamber; a fluid filter comprising a filter element in said chamber intermediate said inlet and said outlet so that hydraulic fluid is normally compelled to pass through said filter element and so that contaminants are removed from the hydraulic fluid just prior to passage of the fluid to said function-controlling elements; and a removable cover normally closing said opening.

3,906,995
TANK CARS
Thomas W. Schmidt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 14, 1974, Ser. No. 497,291
Int. Cl. F17d *1/08*
U.S. Cl. 137—575 **10 Claims**



1. A tank car comprising:

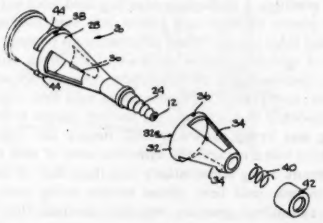
a tank adapted to contain a liquid to be transported, said tank having means associated therewith to form a vertically extending compartment which is in communication with the interior of the tank at the top of the compartment so that liquid filling the tank overflows into the compartment when the liquid level in the tank reaches a predetermined height;

valve means to establish communication between the bottom of the compartment and the bottom of the interior of the tank when the valve means is open and to block such communication when the valve means is closed, said valve means being moved to the closed position when liquid is placed in the interior of the tank and being moved to the open position when liquid is removed from the interior of the tank and liquid is present in the compartment;

and

conduit means extending from the bottom of said compartment to a region exterior of said tank adjacent one end of the tank car.

3,906,996
BREATHING THERAPY AID
Dennis M. DePass, West Islip, and Bruce Berger, Mastic, both of N.Y., assignors to Dennis DePass, Islip Terrace, N.Y.
Filed Sept. 24, 1973, Ser. No. 399,999
Int. Cl.[2] F16K *15/00*
U.S. Cl. 137—604 **6 Claims**



1. In a breathing aid system having a source of oxygen under pressure, a flow meter to control the flow rate of oxygen from said source and a face mask for a patient, the improvement in a device for regulating the concentration of oxygen provided to the face mask comprising:

a first end portion having an inlet port and adapted to be connected to the controlled flow of oxygen,

a second end portion having an outlet port and adapted to be placed in communication with the face mask,

an annular center portion between said inlet and said outlet portions, said center portion having a side wall with first and second ports,

a sleeve mounted for circumferential rotation on said center portion, said sleeve having first and second side wall openings, the overlap between said ports on said center portion and said openings on said sleeve varying as a function of the circumferential position of said sleeve on said center portion,

a flange extending outwardly from one end of said center protion,

a spring at the other end of said center portion positioned between said sleeve and one of said end portions and urging said sleeve against said flange,

one of said flange and said sleeve having a tab extending toward and in contact with the adjacent end of the other of said sleeve and said flange,

the other of said sleeve and said flange having a series of notches adapted to mate with said tab to hold said sleeve in a circumferential position determined by the particular one of said notches which is set at said tab.

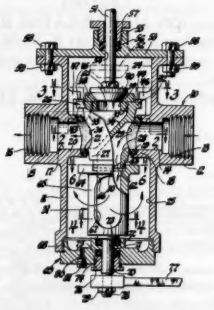
3,906,997
FLUID FLOW CONTROL VALVE

Paul J. Scaglione, 30180 Richmond Hill Dr., Farmington, Mich. 48024

Division of Ser. No. 283,574, Aug. 24, 1972, Pat. No. 3,826,466. This application Apr. 22, 1974, Ser. No. 462,980

Int. Cl.² F16K *11/12*

U.S. Cl. 137—614.16 **3 Claims**



1. A fluid flow control valve comprising:

a. a valve body having a valve chamber therein;

b. an inlet passage communicating with said valve body valve chamber and an outlet passage communicating with said valve body valve chamber at a point diametrically opposite to the inlet passage;

c. an annular seal around each of said passages and being disposed at the point where each of said passages communicates with said valve body valve chamber;

d. a rotatable valve in said valve chamber having an upper end and a lower end and being operatively seated between and against said annular seals;

e. said rotatable valve being rotatable between a first position and a second position and having a pair of chambers formed therein with one of said chambers comprising an inlet chamber having a sidewardly facing inlet port communicating with said inlet passage when the rotatable valve is in a first position and a downwardly facing outlet port communicating with said valve body valve chamber through the lower end of the valve, and the other of said pair of chambers comprising an outlet chamber having an upwardly facing inlet port communicating with said valve body valve chamber through the upper end of the valve and a sidewardly facing outlet port communicating with said outlet passage when the valve is in a first position, whereby fluid entering said inlet passage will pass directly into and through said rotatable valve inlet chamber and downwardly into said valve body valve chamber and thence upwardly through only said valve chamber and around the outside of said valve and thence downwardly into said rotatable valve outlet chamber and directly into said outlet passage;

f. means releasably connected to said rotatable valve for rotating said rotatable valve to a first position to permit said flow of fluid from said inlet passage and through said rotatable valve and only said valve chamber to said outlet passage, and to a second position whereby the flow of fluid between the inlet passage and outlet passage is blocked by said rotatable valve;

g. said rotatable valve including inner surfaces which are arranged to form said inlet and outlet chambers and direct fluid flow through the rotatable valve between said inlet passage and said outlet passage when the rotatable valve is rotated to said first position;

h. each of said annular seals comprising stationary seals;

i. said annular seals comprising wedge shaped seals; and,

j. valve means for regulating the flow of fluid from said valve body valve chamber into said rotatable valve outlet chamber.

3,906,998
PINTLE FOR RADIAL PISTON MACHINES

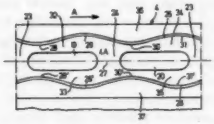
Walter Robeller, Boblingen; Roland Steimann, Stuttgart, and Gerhard Nonnenmacher, Korntal, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

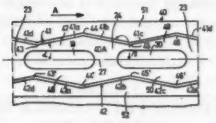
Filed Sept. 28, 1973, Ser. No. 401,942

Claims priority, application Germany, July 7, 1973, 2334592

Int. Cl.² F01B *13/06*

U.S. Cl. 137—625.24 **8 Claims**



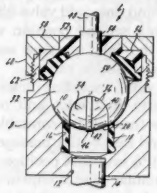


1. For use in a radial piston machine, a pintle having a cylindrical peripheral surface provided with a plurality of control chambers having a common symmetry plane normal to the axis of the pintle, said peripheral surface including a plurality of lands alternating with said control chambers, as considered in the circumferential direction of the pintle, and said surface further having two recesses each constituted by a circumferentially complete groove of unobstructed cross section, flanking said control chambers and being mirror symmetrical to each other with reference to said plane, the distance between said recesses varying periodically, as considered in the circumferential direction of the pintle, and said peripheral surface including a section located between said recesses and having portions of maximum and minimum width which are spaced apart from the centers of said lands, as considered in the circumferential direction of the pintle.

3,906,999
LIQUID VALVE

Alex Manoogian, Grosse Pointe Farms, and Eric V. Pullen, Southfield, both of Mich., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 29, 1974, Ser. No. 528,443
Int. Cl.[2] F16K *13/04*
U.S. Cl. 137—625.32 **11 Claims**



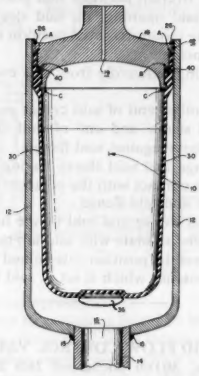
1. A liquid valve comprising housing means defining a valve chamber, a valve seating surface on said housing within said chamber, at least a portion of said surface being concave, spaced apart liquid inlet and outlet passages in said housing means communicating said chamber with exterior of said housing means, a valve member positioned within said chamber, at least a portion of said member being convex and seated against said concave portion, sealing means having an opening therethrough positioned in said inlet passage at the end of said inlet passage proximate said chamber and partially closing said inlet passage end, said sealing means adapted to be urged by liquid pressure in said inlet passage towards said chamber and into engagement with said member, the improvement comprising: said member having a longitudinal slot formed therein, an elongate raised rib projecting from the root of said slot and extending along said slot, handle means operatively secured to said valve member and extending to exterior of said housing means, said housing means including handle control means permitting only rotational movement of said handle means and valve means about an axis of rotation passing through said ball means, said valve member being movable between a first position wherein said convex surface closes said inlet passage and a plurality of second positions wherein said slot interconnects said inlet and outlet passages, said rib bearing on said sealing means and holding said sealing means in said inlet passage against the force of liquid pressure when said valve means is in said second positions.

3,907,000
HYDRO-PNEUMATIC FLEXIBLE BLADDER ACCUMULATOR

George J. Carr, Gardena, Calif., assignor to Teledyne Sprague Engineering, a division of Teledyne, Inc., Gardena, Calif.

Filed Apr. 25, 1974, Ser. No. 464,184
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—30 **3 Claims**

1. A hydro-pneumatic accumulator comprising: an elongated shell having a liquid port at one end and a gas port at the other end; a supporting structure fixed to said shell and defining a first annular skirt section of reduced diameter forming a first shoulder, and a second annular skirt section of further reduced diameter, the first and second skirt sections being displaced radially inwardly from the inner surface of said shell, and the second skirt section forming a second shoulder and having a lip at the end thereof and forming a peripheral groove between the lip and the second shoulder; an O-ring extending around said groove adjacent to the second shoulder; and a thimble-shaped bladder of resilient, deformable material mounted in said shell between the liquid port and the gas port with its mouth extending over said first and second annular skirt sections of said supporting structure in resilient engagement therewith; and with the rim of the bladder extending into the space between the first and second skirt sections and the

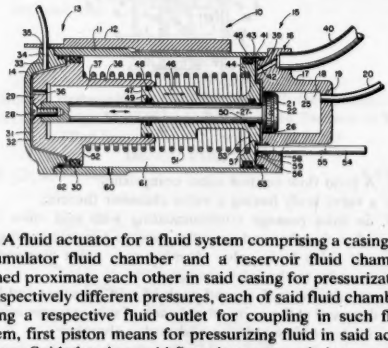


inner surface of said shell, over the lip of the second skirt section and over the O-ring, and said rim having an undercut end portion which extends over the first skirt section.

3,907,001
COMBINATION ACCUMULATOR RESERVOIR

Robert D. Vanderlaan, and Robert F. Boyle, both of Kalamazoo, Mich., assignors to Pneumo Dynamics Corporation, Boston, Mass.

Filed Feb. 12, 1973, Ser. No. 331,522
Int. Cl. F16l *55/04*
U.S. Cl. 138—31 **15 Claims**



1. A fluid actuator for a fluid system comprising a casing, an accumulator fluid chamber and a reservoir fluid chamber formed proximate each other in said casing for pressurization at respectively different pressures, each of said fluid chambers having a respective fluid outlet for coupling in such fluid system, first piston means for pressurizing fluid in said accumulator fluid chamber, said first piston means being movably positioned in said casing and having first and second opposed surfaces, the first being in fluid communication with said accumulator fluid chamber and the second being in fluid communication with said reservoir fluid chamber, second piston means for pressurizing fluid in said reservoir chamber, said second piston means being movable in said casing independently of said first piston means, said first and second pist on means including a respective portion positioned concentrically with respect to each other and actuating means for applying an actuating force to said first piston means and to said second piston means to effect pressurization of fluid in both said respective fluid chambers, whereby upon such actuation of said fluid actuator fluid pressure at said respective fluid outlets is maintained substantially constant at respect levels.

3,907,002

CONNECTION BETWEEN AN INJECTION INTERNAL COMBUSTION ENGINE AND A FUEL TANK

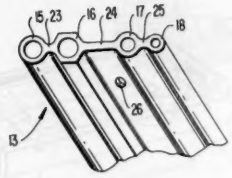
Hans-Adolf Gülich, Bensberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 10, 1973, Ser. No. 349,695

Claims priority, application Germany, Apr. 11, 1972, 2217252

Int. Cl.[2] F16L 9/18

U.S. Cl. 138—115 9 Claims



1. A hose member comprising a plurality of elongated channels provided in a unitary structure of a single flexible material, said single flexible material forming walls of said channels and forming interconnecting webs between said channels, thereby forming said unitary structure, said plurality of elongated channels being arranged adjacent to one another in a parallel row of said unitary structure, means for distinguishing individual ones of said plurality of channels, said means for distinguishing individual ones of said elongated channels being at least one of different cross-sectional channels of said individual ones and different separation distances of said interconnecting webs between adjacent ones of said plurality of elongated channels, and at least one of aperture means and projection means formed in said interconnecting webs for mounting said hose member.

3,907,003

SHIRRED SAUSAGE CASINGS AND METHOD AND APPARATUS FOR MAKING SAME

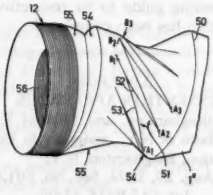
Richard Regner, and Gerd Schug, both of Mainz-Bretzenheim, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Continuation-in-part of Ser. No. 290,816, Sept. 21, 1972. This application July 24, 1973, Ser. No. 382,159

Claims priority, application Germany, July 26, 1972, 2236600

Int. Cl.[2] A22C 13/02

U.S. Cl. 138—118.1 4 Claims



1. A stick consisting of a circular-cylindrical casing that has been shirred to form a hollow cylinder, and displaying an outwardly projecting helical main fold and further displaying, in the extended and flattened state, secondary fold lines lying between the windings of the helical line of the main fold, said lines of the secondary fold consisting of a continuous, uninterrupted, uniform zigzag line which is substantially without further secondary folds, that the peaks of this zigzag line have a substantially constant distance from the helical line of the main fold, and that the individual sections of this zigzag line are helical sections which wind in the opposite sense to the helical main fold.

3,907,004

LIGHT AND RIGID FIBER GLASS REINFORCED PLASTIC COMPOSITE PIPES

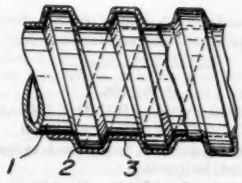
Ikutoshi Yamaguchi; Yukimasa Terui, and Katsumi Akiyoshi, all of Kodaira, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed June 21, 1973, Ser. No. 372,449

Claims priority, application Japan, June 22, 1972, 47-062720

Int. Cl.[2] F16L 11/08

U.S. Cl. 138—132 9 Claims



1. A light and rigid fiber glass reinforced plastic composite pipe comprising (1) an inner tube formed by winding glass fiber threads impregnated with a thermosetting resin on a mandrel by a filament winding process, (2) a geometrically shaped rib spirally wound round the inner tube, said rib being produced by mixing 100 parts by weight of a unsaturated polyester resin, 0.5–10 parts by weight of magnesium oxide, 0.1–5 parts by weight of a cross-linking agent, 100 to 900 parts by weight of a filler and 0–30 parts by weight of a diluting agent and simultaneously thickening the mixture at a temperature of 20°–60°C, and extrusion molding the thickened mixture, said rib being ultimately hardened, and (3) an outer layer covering the inner tube and the rib, said outer layer being composed of said glass fiber threads impregnated with a thermosetting resin.

3,907,005

METHOD OF STOPPING A WEAVING MACHINE AUTOMATICALLY, AND A YARN STOP MOTION FOR PERFORMING THE METHOD

Hans Demuth, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 8, 1974, Ser. No. 495,825

Claims priority, application Switzerland, Aug. 10, 1973, 11541/73

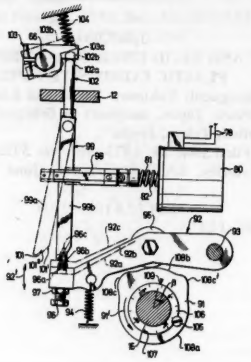
Int. Cl.[2] D03D 51/18

U.S. Cl. 139—340 19 Claims

1. In a loom having a main shaft for driving the loom and a yarn monitoring device for detecting yarn breaks;

a yarn stop motion including a first means connected to said yarn monitoring device for stopping the loom a first time in response to detection of a broken yarn in a first angular position of said main shaft and a second means for auto-

matically stopping the loom a second time within the same weaving cycle in a second and different angular



position of said main shaft after restart subsequent to the first stoppage in said first angular position.

3,907,006

APPARATUS FOR INDICATING THE BREAKAGE OF WARP THREADS IN A LOOM

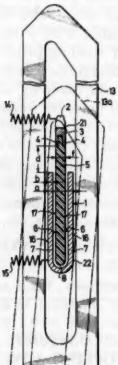
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Switzerland

Filed July 15, 1974, Ser. No. 488,794

Claims priority, application Switzerland, July 24, 1973, 010763

Int. Cl.[2] D03D *51/20*

U.S. Cl. 139—353 3 Claims



1. Apparatus for indicating the breakage of a warp thread in a loom, said apparatus comprising an electrically conductive bar of U-shaped cross-section extending crosswise of the loom, an electrically insulative support bar extending parallel to and disposed partly within the U-shaped cross-section of said first-named bar, said support bar further extending exteriorly of said cross-section with one longitudinal edge of said support bar being outside said cross-section, and an electrically conductive bar affixed to the support bar along said one longitudinal edge and being in its entirety outside said cross-section.

3,907,007

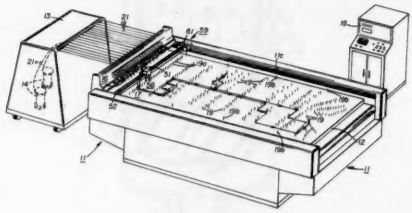
APPARATUS AND METHOD FOR FORMING WIRES ON A WIRE-RECEIVING MEMBER

Billy H. Hobbs, Dallas; Gary P. Krahmer, Mesquite, and Virgil W. Wood, Rockwall, all of Tex., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 23, 1974, Ser. No. 436,017

Int. Cl.[2] B21F *27/00*

U.S. Cl. 140—93 R 25 Claims



1. Apparatus for forming wires in sequence on a wire-receiving member having an array of wiring points defined thereon, utilizing wires mounted on a plurality of respective wire supplies, which comprises: a

a plurality of wiring guides releasably mounted on respective seats and each capable of having at least one wire fed therethrough from a respective one of the wires supplies as said wiring guide is moved through the wiring points on the wire-receiving member in a wire forming operation, said wiring guides being separately movable through the wiring points on the wire-receiving member relative to and independently of each other and the wire supplies;

a wire positioning device movable relative to the wire-receiving member independently of the wire supplies and said wiring guides;

means for releasably attaching a preselected one of said wiring guides to said wire positioning device when said wire positioning device is moved adjacent said wiring guide; and

means for moving said wire positioning device adjacent a preselected one of said wiring guides to attach said wire positioning device to said preselected wiring guide, for then moving said wire positioning device and said attached wiring guide through preselected ones of the wiring points on the wirereceiving member relative to and independently of the wire supplies and said wiring guides remaining on the seats to form the wire through the preselected wiring points in a predetermined pattern, and to return said wiring guide to its respective seat when a wiring operation has been completed.

3,907,008

INSERTION APPARATUS

Erwin F. Bates, Binghamton, and Michael D. Snyder, Chenango Bridge, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

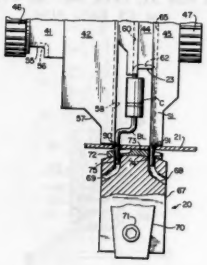
Filed Aug. 29, 1974, Ser. No. 501,682

Int. Cl.[2] B21F *45/00*

U.S. Cl. 140—105 14 Claims

1. An apparatus for continually forming taped electrical components having a body portion and first and second coaxial lead portions extending therefrom in opposite directions, said components being parallel taped by two tapes securing their lead extremities, said apparatus comprising means to receive a taped length of said taped components, means to index components sequentially into a forming position, means for holding one lead portion adjacent but spaced from said body component, means to sever said taped lead extremities

from said leads, and means to form the severed extremity of said first lead portion, means for engaging a lead portion and



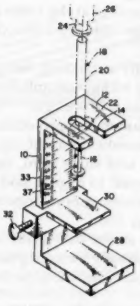
bending said second lead portion about said holding means so that said body portion is parallel to the second lead portion.

3,907,009

HYPODERMIC LOAD CALIBRATOR

Charles Dobbins, 65-24 162nd St., Flushing, N.Y. 11365

Filed Oct. 15, 1974, Ser. No. 514,677
Int. Cl.² B65B *3/32*
U.S. Cl. 141—27 **4 Claims**



1. An apparatus for loading a hypodermic syringe of the type having an integral needle with a predetermined dosage of a fluid that is in a container having rupturable closure wall which is adapted to be pierced by the hypodermic needle to thereby provide direct fluid communication between the interior of the container and the interior of the hypodermic syringe, said apparatus comprising:

a. a post having indicating means thereon corresponding to the predetermined dosage;

b. a first, non-adjustable member rigidly secured to said post and adapted to engage a portion of the hypodermic syringe;

c. a second, movable member adjustably carried by said post; said second member having means to receive another portion of the hypodermic syringe that is relatively movable with respect to the first portion of the hypodermic syringe; and

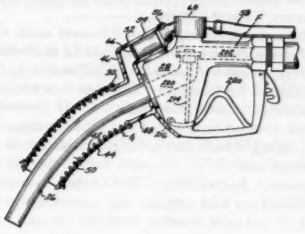
d. means to lock said movable member in a fixed position relative to said indicating means on said post.

3,907,010

ANTI-POLLUTION SERVICE STATION ASSEMBLY

Wilson A. Burtis, 5011 Harvard Ave., Westminster, Calif. 92683, and William C. Babcock, 2732 Walker Lee Dr., Los Alamitos, Calif. 90720

Filed Oct. 26, 1973, Ser. No. 409,939
Int. Cl. B65b *31/06*
U.S. Cl. 141—45 **14 Claims**



1. In combination with a service station that dispenses volatile hydrocarbon fuel to internal combustion engine-powered vehicles of the type which include a fuel tank having a fuel inlet tube and a cap that removably closes said free end, which service station includes an electrically operated pump having a liquid discharge opening and a suction opening therein; an underground fuel storage reservoir having a filling tube, a vent opening, and first and second openings in the upper portion of said reservoir; a first conduit connected to said suction opening and extending downwardly through said first opening to terminate adjacent the bottom of said storage reservoir; a second flexible conduit having first and second ends, with said first end of said second conduit being connected to said discharge opening; a nozzle assembly connected to said second end of said second conduit, said nozzle assembly including a fuel discharge tubular member that may be inserted in said fuel inlet tube, and a normally closed spring-loaded valve in communication with said tubular member and said second end of said second conduit, with said reservoir being filled with volatile hydrocarbon fuel from a delivery truck having a tank thereon which by a hose may be connected to said filling tube of said reservoir, the improvement for preventing the escape of said hydrocarbon fuel in the form of vapor to the ambient atmosphere both when fuel tanks on said vehicles and said reservoir is being filled with hydrocarbon fuel, which improvement comprises:

a. a first longitudinally deformable, resilient tubular shroud that extends about said fuel discharge tubular member, which shroud has first and second ends, with said first end being sealed to said nozzle assembly and said first shroud being formed from a material impervious to said hydrocarbon fuel;

b. first means on said second end of said first shroud for removably engaging said flange and removably interlocking said second end of said first shroud in sealing engagement with said fuel inlet tube, with said first shroud and fuel discharge tubular member cooperatively defining a first confined space therebetween that is in communication with the interior of said vehicle fuel tank when said second end of said first shroud is in sealing engeagement with said fuel inlet tube;

c. a first blower having an inlet and a discharge opening;

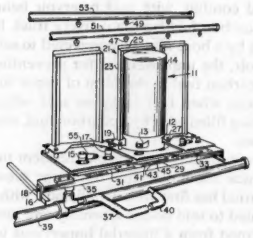
d. electric power means for operating said pump;

e. second means for concurrently actuating said first blower when said pump operates;

f. a third conduit connected to said first shroud and in communication with said first confined space and said blower inlet;

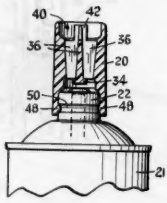
g. a fourth conduit extending between said blower discharge and said second opening in said reservoir;
h. first hydrocarbon fuel vapor adsorbing means connected to said vent to prevent escape of hydrocarbon vapor from said reservoir to the ambient atmosphere, with said blower cooperating with said third and fourth conduits to return hydrocarbon vapor from said fuel tank to said reservoir during the filling of said fuel tank at said service station;
i. a second power-operated blower mounted on said vehicle, which second blower has an inlet opening and a discharge opening formed therein;
j. a fifth conduit having first and second ends, with said first end being connected to said inlet of said second blower;
k. third means for connecting said second end of said fifth conduit to the interior of said reservoir when said hose is connected to said filling tube of said reservoir;
l. a sixth conduit having first and second ends, with said first end being connected to said discharge of said second blower; and
m. second hydrocarbon fuel vapor adsorbing means mounted on said vehicle and connected to said second end of said sixth conduit, with said second vapor adsorbing means adsorbing hydrocarbon fuel vapor drawn from said blower as said reservoir is filled with liquid hydrocarbon fuel from said vehicle through said hose to prevent displaced hydrocarbon fuel vapor in said reservoir from being discharged into the ambient atmosphere.

3,907,011
LIQUID TRANSFER APPARATUS FOR USE IN THE WASHING OF CONTAINERS
Ernest R. Edmunds, 233 Wilcox St., Wilson, N.Y. 14172
Filed Oct. 9, 1973, Ser. No. 404,788
Int. Cl.[2] B67C *1/00*
U.S. Cl. 141—92 **29 Claims**



1. An apparatus for transferring pressurized liquid from a source thereof to the interior of a movable container in a container washing apparatus through an opening in such container which comprises a stationary transfer manifold and a connector box, the transfer manifold communicating with the source of liquid and having an opening therein for passing liquid from it through the connector box to a container being washed, said connector box having an opening therein matchable with and holdable against the opening in the transfer manifold when the container is stationary, and means for communicating the connector box with an opening in the container to force liquid through said opening.

3,907,012
ADAPTOR FITTING FOR BLOWING UP INFLATABLE DEVICES
James E. Burke, North Riverside, Ill., assignor to VCA Corporation, Greenwich, Conn.
Filed May 31, 1974, Ser. No. 475,137
Int. Cl. B67c *3/26*
U.S. Cl. 141—349 **9 Claims**



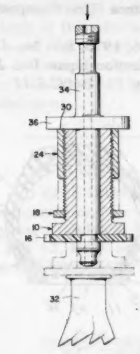
1. A compressed gas device for inflating tires and other inflatable articles, comprising in combination:
a. a pressurized aerosol container having a valve-mounting cup and a depressible valve part carried by said cup;
b. a combined actuator-inflator fitting for transferring pressurized gas from the container to the article to be inflated;
c. said fitting comprising a tubular, double-ended member;
d. means providing a recess at one end of said tubular member to receive a valve stem, having a valve pin therein, of the inflatable article;
e. means including a socket at the other end of said tubular member engageable with the valve part of the aerosol container;
f. at least one radially extending, integrally formed web member positioned within said tubular member intermediate said recess and said socket;
g. imperforate extension means projecting axially from each end of said web member, one of said extension means adapted to engage said valve stem, the other of said extension means adapted to engage said valve part to actuate the same for releasing pressurized gas from the container to the fitting; and
h. cooperable means on the fitting and valve mounting cup for releasably frictionally mounting the fitting on the cup in an inoperative position when the fitting is not in use.

3,907,013
FILLING HEAD CONTROL
Earl William Harvey, Weston, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed July 18, 1973, Ser. No. 380,373
Int. Cl.[2] B67C *3/22;* **B65B** *3/04*
U.S. Cl. 141—392 **7 Claims**

1. A filling head control assembly for controlling the penetration depth of a nozzel into an opening of a neck of a container, which comprises:
a. an annular flange affixed externally onto said nozzle;
b. a body having a threaded outer surface thereon and a longitudinal bore therethrough, said nozzle extending through said longitudinal bore;
c. a flange affixed to a lower end of said body, said lower end and said flange engaging said neck of said container;
d. a member having a threaded longitudinal bore therethrough adjustably engaging said threaded outer surface of said body, an upper portion of said member engaging said annular flange affixed onto nozzle; causing a lower end of said nozzle to be adjusted longitudinally within

said neck of said container and

e. a ring screw element having a threaded bore for adjustably engaging said threaded outer surface of said body, said ring screw element engaging said member.

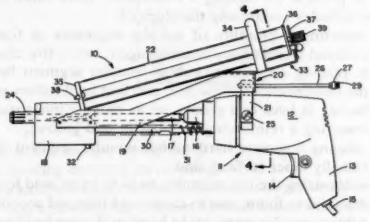


3,907,014

MECHANISM FOR FEEDING AND DRIVING SCREWS

Anthony P. Manino, 1124 Chess Dr., Foster City, Calif. 94404

Filed Apr. 29, 1974, Ser. No. 464,752
Int. Cl. B25b *23/04*
U.S. Cl. 144—32 **10 Claims**



1. In a mechanism for feeding elongated cylindrical threaded fasteners having a shank of given diameter and a driving head of given larger diameter including a driving surface at one end thereof, one by one from a magazine containing an array of a plurality of said fasteners in substantially coaxial alignment along a given axis into coaxial alignment with an elongated cylindrical tool including a motor for rotating said tool about its cylindrical axis, said tool having a diameter substantially equal to said diameter of said driving head of said fasteners and having a tip adapted to engage said driving surface in said head of said fasteners; said cylindrical axis of said tool intersecting said given axis of said substantially coaxially aligned array of fasteners in said magazine at a given angle; and said tool and said magazine being mechanically interconnected for reciprocating movement with respect to each other whereby each of said plurality of fasteners may be individually driven in turn along said cylindrical axis of said tool; the improvement comprising:

a. a block member located at the intersection of said given axis of said substantially coaxially aligned array of fasteners with said cylindrical axis of said tool, said block member including a cylindrical passageway therethrough having a diameter larger than said diameter of said tool coaxially aligned with said cylindrical axis of said tool and means for receiving each of said fasteners from said magazine in turn and aligning them with said tool for driving; and

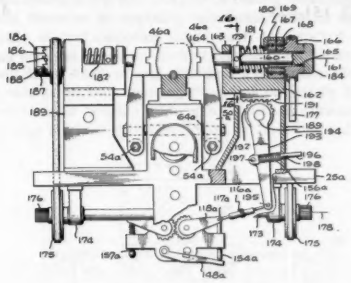
b. an elongated rigid frame means having one end rigidly fixed to said block, at least a portion of said frame extending along said given axis and removably supporting said magazine in fixed relationship to said block, the other end of said frame means being mechanically interconnected with said tool for slidable movement with respect to said tool in directions parallel to said cylindrical axis of said tool whereby said given angle formed between said given axis and said cylindrical axis remains constant during reciprocating movement of said frame together with said block and magazine with respect to said tool.

3,907,015

APPARATUS FOR CUTTING PATTERN IN GUN STOCK OR OTHER WORK PIECE

Frank A. Pachmayr, Los Angeles, and Edward B. Miller, Harbor City, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Division of Ser. No. 156,655, June 25, 1971, Pat. No. 3,882,911. This application Sept. 23, 1974, Ser. No. 508,518
Int. Cl.² B27M *3/00*
U.S. Cl. 144—136 J **20 Claims**



1. Apparatus comprising:

a support;

a work holder mounted to said support and adapted to hold a work piece;

a cutter structure having cutting edges arranged in a predetermined pattern which is to be essentially reproduced on the work piece; and

means for producing relative vibratory movement between said cutter structure and said work holder and carried work piece, while the cutter structure is positioned for contact with the work piece, and in a relation progressively cutting said pattern on the work piece;

said cutter structure being mounted for vibratory movement essentially along an axis entending toward and away from the work piece;

said means including a wheel turning essentially about said axis and operable upon rotation to vibrate said cutter structure along the axis.

3,907,016

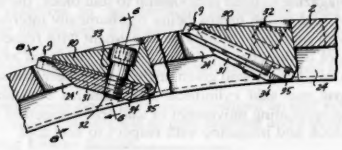
PERIPHERAL CHIPPER CUTTING BIT HOLDER

Thomas W. Nicholson, and Ray B. Jorgensen, both of Seattle, Wash., assignors to Nicholson Manufacturing Company, Seattle, Wash.

Continuation of Ser. No. 249,705, May 2, 1972, abandoned, which is a division of Ser. No. 883,038, Dec. 8, 1969, Pat. No. 3,661,192. This application May 22, 1973, Ser. No. 363,182
Int. Cl.² B27L *11/02*
U.S. Cl. 144—172 **4 Claims**

1. In a chipper, a hollow rotary cylindrical chipping drum including a plurality of bits having cutting edges projecting generally tangentially outward from its periphery, each of said bits being a bent plate including a central plate portion and two opposite side plate portions at dihedral angles to said central plate portion and having a cutting edge at an end

including a central section and two side sections, said central plate portion and said side plate portions being of equal thick-



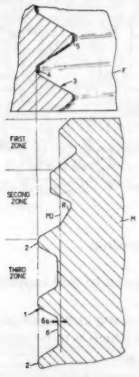
ness, said three cutting edge sections being disposed substantially in a plane perpendicular to said central plate portion.

3,907,017

INTERFERING THREAD FORM

Glenn W. Stanwick, 1325 Valley Ridge Dr., Brookfield, Wis. 53005

Filed Sept. 30, 1974, Ser. No. 510,315
Int. Cl.² F16B *39/30*
U.S. Cl. 151—22 **4 Claims**



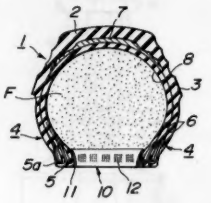
1. A male thread form member having crests of generally constant uniform diameter throughout the major portion of its length and for being received in a standard female V-shaped thread form, said male member comprised of three axial zones along its length including a first initial engagement zone, a second zone having a thread root of progressively increasing diameter from said first zone, and a third zone, said thread root in said second zone also having its radially innermost portion formed with a gentle and gradual wave pattern which rises and falls in a direction along the circumferential length of the root, whereby cold working and deformation of said female thread form occurs in said second zone of said male member, the cross sectional shape of the crest of threads in said second zone being generally arcuate, said third zone having a root diameter which is greater than its normal pitch diameter by a maximum amount determined by a percentage of the pitch of the threads as follows: (a) for a pitch of the threads of from about 4 to 19 threads per inch, the maximum root diameter over its normal conventional pitch diameter is 5 per cent of the pitch of the threads; (b) for a pitch of the threads of from about 20 to 64 threads per inch, the maximum root diameter over its normal conventional pitch diameter is 10 per cent of the pitch of the threads; and (c) for a pitch of the threads of from about 65 to 80 threads per inch, the maximum root diameter over its normal conventional pitch diameter is 13 per cent of the pitch of the threads.

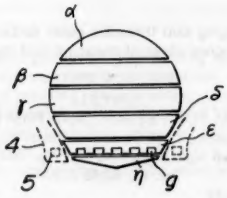
3,907,018

TIRE FILLED WITH FOAMED MATERIAL

Akira Fujikawa, and Takashi Hoshino, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 6, 1973, Ser. No. 422,488
Claims priority, application Japan, Dec. 27, 1972, 47-2096
Int. Cl.² B60C *7/12*
U.S. Cl. 152—310 **2 Claims**





1. A process for making a removable, foam filled tire for heavy vehicles comprising the steps of:

a. inserting a plurality of annular segments of foamable material containing a foaming agent into a tire chamber;
b. placing a first hard rubber annular segment between the bead portions of the tire, said first hard rubber portion having at least one groove on its radially inner surface;
c. inserting a reinforcing member in said groove;
d. placing a second hard rubber annular segment on said radially inner surface, and
e. vulcanizing the tire assembly so as to cause said foamable material to foam, and to cause said first and second hard rubber annular segments to bond to the tire bead portions to thereby prevent escape of the foamed material.

3,907,019

TIRE TREADS MADE OF AN ORIENTED ELASTOMER MIXTURE

Jean Bernard Montagne, Cebazat, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 182,616, Sept. 22, 1971, abandoned. This application May 2, 1974, Ser. No. 466,123
Int. Cl.² B29H *17/37*; B60C *11/00*
U.S. Cl. 152—330 R **7 Claims**

1. A pneumatic tire comprising a carcass, a carcass reinforcement reinforcing said carcass, bead wires anchoring opposite ends of said carcass reinforcement, a tread, and a tread reinforcement reinforcing said tread, said tread having

a surface that makes contact with the ground in a tire footprint area during rolling of the tire, said tread being formed of a vulcanized elastomer mixture, the elastomer of said elastomer mixture having been stretched in the unvulcanized state beyond its elastic limit in thin sheets and being oriented in a direction which is parallel to said surface of said tread and having a modulus of elasticity, rupture strength, elongation at rupture, electrical resistivity, and hysteresis which are different in different directions.

3,907,020

FIRE DAMPER

James R. Root, Independence, Mo., assignor to Ruskin Manufacturing Company, Grandview, Mo.

Filed July 12, 1973, Ser. No. 378,511
Int. Cl.² E05D 7/10; E06B 3/32
U.S. Cl. 160—1 **3 Claims**

1. A fire damper comprising:
a housing defining an opening;
a plurality of interconnected blades coupled with said housing and movable relative to each other from a folded to an unfolded position,
each of said blades comprising a generally planar intermediate portion having at opposite ends first and second incomplete generally cylindrical portions terminating in first and second generally planar lips, respectively,
said first cylindrical portion extending through an arc of approximately 240° and presenting a heel along its outer periphery as it merges into said planar lip and having a larger radius than said second cylindrical portion, the latter extending through an arc of approximately 180° and adapted to turn within said first portion as said blades move relative to each other,
said first lip being directed radially inward at an oblique angle relative to an imaginary extension of said planar intermediate portion and being of a length greater than the length of said second lip,
said second lip being directed radially inward in generally planar alignment with said planar intermediate portion,
whereby when said blades move to said unfolded position and said second cylindrical portion turns in the first cylindrical portion, the terminal end of said first lip engages the second lip at the point of juncture of the latter with said second cylindrical portion and the heel of said first portion engages the inner surface of said second portion thereby limiting the relative angular movement between adjacent blades to less than 180° and
means for holding said blades in a folded position during normal operating conditions and for releasing said blades during fire conditions to block said opening.

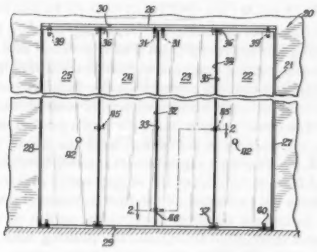
3,907,021

ALIGNMENT AND RETENTION HARDWARE FOR FOLDING DOORS

Lester L. Smith, 5151 Mission Hills Dr., Tucson, Ariz. 85718

Filed Apr. 29, 1974, Ser. No. 465,235
Int. Cl.² E06B 3/48
U.S. Cl. 160—118 **4 Claims**

1. In a folding door installation, the combination comprising: pair of door jambs having opposing vertical edges and a horizontal guide track therebetween, one or more pairs of parallel aligned folding door panels mounted for lateral opening and closing movements between said door jambs the panels of each pair being hingedly interconnected between adjacent opposing vertical edges, with one panel having one vertical edge supported for pivotal movement on one of said door jamb edges and the other panel vertical edges supported for pivotal and horizontal movement along said track and plural alignment assemblies mounted in at least some of said opposing edges for aligning and retaining the panels in coplanar closed condition between said jambs, each said assembly comprising a female socket member, and a cooperating male projection member; each member having a cylindrical housing portion inserted into one of a pair of mating mounting sockets formed therefor in opposing substantial coaxial alignment inwardly of said opposing edges each said socket member having an axial chamber open at one end, and detent means formed at the entry of said chamber; a projection element of each said projection member extending outwardly from one end of its said housing portion to protrude outwardly of a panel edge in which the same is mounted and adapted to enter

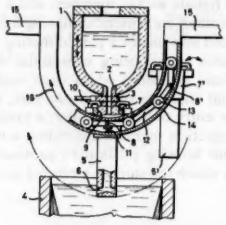


the open end of a said chamber of an opposing said socket member upon coplanar positioning of adjacent panels, resilient cam means on each projection element for aligning and detachably engaging said detent means of a cooperating said socket member thereby to removably interlock adjacent panels in coplanar condition; means retaining the said projection element of each projection member mounted in a panel edge in its said housing portion, and the said projection element of each projection member mounted in a horizontally movable panel edge being movable coaxially of its housing portion, and spring means normally biasing said movable projection element outwardly of its said housing portion and permitting the same to resiliently retract thereinto upon closing engagement with an opposing edge until cammed into alignment by a cooperating said socket member for entry thereinto; said pairs of projection and socket members cooperating upon further closing movement of the door panels to align and removably retain the same in coplanar condition and tang and rib means extending outwardly of the exterior of each said housing portion to prevent its rotation and withdrawal from its mounting socket.

3,907,022
METHOD OF HANDLING AND REPLACING POURING TUBES OF A CONTINUOUS CASTING APPARATUS

Willi Simons, Dusseldorf; Horst Grothe, Kaarst; Rolf Haselhuhn, Dusseldorf, all of Germany; Peter Koenig, Zumikon, Switzerland, and Klaus Brock, Dusseldorf, Germany, assignors to Schloemann-siemag Aktiengesellschaft, Dusseldorf, Germany and Concast AG, Zurich, Switzerland, part interest to each

Division of Ser. No. 82,750, Oct. 21, 1970, Pat. No. 3,743,007.
This application Apr. 23, 1973, Ser. No. 353,308
Claims priority, application Switzerland, Oct. 30, 1969, 016169/69; Germany, Nov. 13, 1969, 1957037The portion of the term of this patent subsequent to July 3, 1990, has been disclaimed.
Int. Cl.² B22D *11/10*
U.S. Cl. 164—82 9 Claims



1. A method of handling and replacing pouring tubes used for pouring molten metal from a supply vessel into a mold of a continuous casting machine without interrupting the continuous casting operation, comprising the steps of positioning a pouring tube beneath and in alignment with an outlet of the supply vessel and beneath the surface of a pool of metal in the mold for conducting molten metal from the supply vessel into the mold, positioning a replacement pouring tube at a location removed from the outlet of the supply vessel and in a position preparatory for exchange of the first-mentioned pouring tube located in casting position beneath the outlet of the supply vessel, and upon need to replace the pouring tube located in casting position beneath the outlet of the supply vessel, displacing the pouring tubes along a path such that as the pouring tubes are moved, the pouring tube which is beneath the outlet of the supply vessel is moved out of alignment with said outlet and the replacement pouring tube is moved into alignment with such outlet.

3,907,023
PROCESS FOR STARTING AN OPERATION TO CONTINUOUSLY CAST METAL ROD

Larry D. Frus, Whittier, Calif., assignor to Stoody Company, Santa Fe Springs, Calif.

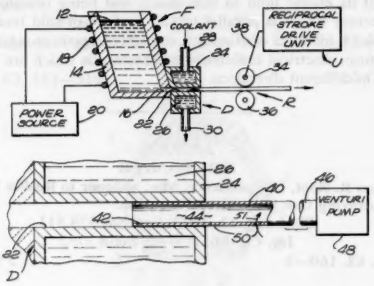
Filed July 23, 1973, Ser. No. 381,965
Int. Cl.² B22D *11/08*
U.S. Cl. 164—82 10 Claims

1. A starting process for the continuous casting of a solid rod of metal, wherein a stream of molten metal is flowed into a casting cavity to be cooled therein for horizontal movement in an externally-solidified, continuous-length form through a passage from said casting cavity, comprising:

placing a hollow section of solid metal horizontally disposed in said passage from said casting cavity;

releasing said stream of molten metal to provide an initial flow of said molten metal to enter said hollow section and become welded thereto; and

moving said hollow section of metal to withdraw out of said passage from said cavity along with metal from said

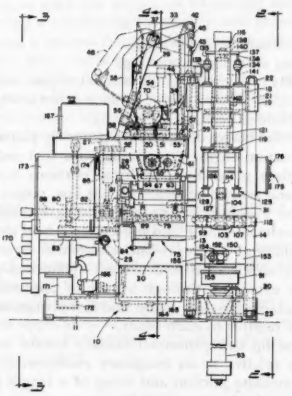


stream, to begin said process for the continuous casting of a rod of solid metal.

3,907,024
MATCHPLATE MOLDING MACHINE

Robert G. Shields, Chagrin Falls; Warren A. Blower, and Edmond K. Hatch, both of Brecksville, all of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 216,013, Jan. 7, 1972, Pat. No. 3,794,103.
This application Jan. 3, 1974, Ser. No. 430,644
Int. Cl.² B22C *15/08*
U.S. Cl. 164—212 21 Claims

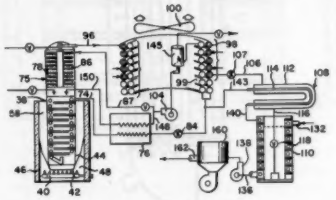


1. A foundary molding machine comprising a vertically movable table adapted to support a sand filled flask having a pattern therein, a squeeze head thereabove, a piston-cylinder assembly supporting said table for movement, said assembly including smaller and larger concentric pistons, means to supply fluid pressure to the smaller piston initially to elevate the table, the elevation of the table drawing fluid beneath the larger piston, and means to supply fluid pressure to both pistons to obtain high pressure squeeze.

3,907,025
COMPACT HEATING AND COOLING SYSTEM

Norman D. Malcosky; Ronald H. McLean, both of Columbus; Kanwal N. Singh, Westerville, and Chung M. Auh, Columbus, all of Ohio, assignors to Columbia Gas System Service Corporation, Wilmington, Del.

Division of Ser. No. 350,822, April 13, 1973, Pat. No. 3,828,575. This application June 28, 1974, Ser. No. 484,460
Int. Cl.[2] F25B 29/00
U.S. Cl. 165—63 14 Claims



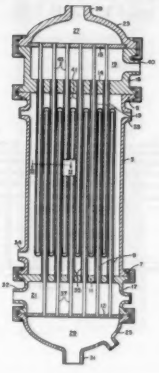
1. In an absorption-type refrigeration system which includes a generator, condenser, absorber and evaporator, and conduit means for circulating heat exchange medium to and from said evaporator, the improvement which comprises, a selectively operable boiler in fluid communication with said conduit means for selectively heating said heat exchange medium, said boiler including a gas fired burner and having flame holder means, means for supplying pressurized gas and air to said flame holder whereby said gas and air produce blue flame combustion on said holder, means defining a heating chamber above said burner and a heat exchange medium heat exchanger mounted in said chamber in fluid communication with said conduit means, said means for supplying pressurized gas and air and said flame holder cooperating with the other structure to prevent the free circulation of air through said chamber when said burner is not operating and thereby prevent said heat exchanger from being exposed to ambient atmospheric conditions when said burner is not operating, and whereby said boiler is adapted to heat said heat exchange medium flowing through said evaporator thereby to form a combined compact selectively operable heating and cooling system.

3,907,026
DOUBLE TUBE HEAT EXCHANGER

James D. Mangus, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 21, 1973, Ser. No. 390,282
Int. Cl. F28f 1/00
U.S. Cl. 165—70 9 Claims

1. A heat exchanger comprising a shell portion, a first group of tubes through which a primary fluid flows, a second group of tubes through which a secondary fluid flows, said first and second groups being so disposed that a tube of one group is disposed between a plurality of tubes in the other group, heat conducting means disposed between said tubes engaging at least one tube in each group, said heat conducting means being segmented, and insulating means being disposed between segments of said heat conducting means, whereby a portion of the heat energy in the fluid in the one group of

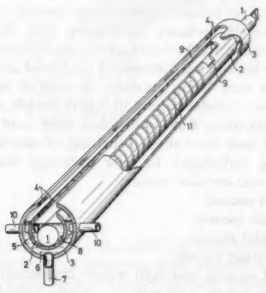


tubes is transferred via the heat conducting means to the fluid in the other group of tubes.

3,907,027
APPARATUS FOR VAPORIZING A DEVELOPER MEDIUM IN DEVELOPING DEVICES FOR LIGHT-SENSITIVE MATERIALS

Gerhard Marx, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Feb. 25, 1974, Ser. No. 445,470
Claims priority, application Germany, Feb. 28, 1973, 2309851
Int. Cl. F28d 7/10
U.S. Cl. 165—155 6 Claims



1. An apparatus for vaporizing a developer medium from a solution, in a developing device for light-sensitive material, comprising heating rod means,

at least two substantially concentric pipe means surrounding said rod means and having closed ends and elongated aperture means therein,

inlet means on the outer pipe means,

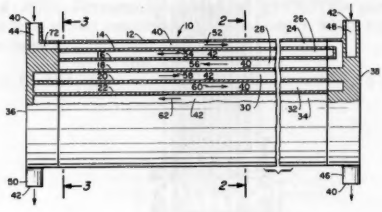
outlet means on the inner pipe means,

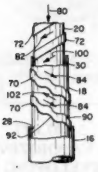
and aperture means connecting said outer and inner pipe means, whereby a pool of solution is formed in contact with said heating rod means when said apparatus is operated in a horizontal position.

3,907,028
CONCENTRIC CYLINDER HEAT EXCHANGER

Drew B. Lawson, Los Gatos, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1974, Ser. No. 466,351
Int. Cl.[2] F28D 7/00
U.S. Cl. 165—156 3 Claims





1. A concentric tube heat exchanger for transferring heat from one fluid to another fluid comprising:

a. a cylindrical casing having a first and a second end;

b. a plurality of concentric cylinders located inside said cylindrical casing, each pair of adjacent concentric cylinders having an annular space therebetween, each said cylinder having a first and a second end;

c. a plurality of helical-shaped vanes having continuously wave shaped surfaces contacting said fluid flowing thereby connected between adjacent concentric cylinders with one vane being disposed in each said annular space, each said vane being attached to each of its respective concentric cylinders along its entire length, said attachments providing fluid-tight seals with said concentric cylinders, said wave shaped surfaces of said helical vanes imparting turbulence to heat exchange fluids flowing through said annular spaces;

d. first inlet means;

e. first outlet means;

f. second inlet means;

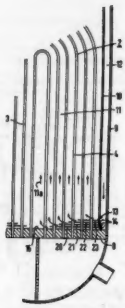
g. second outlet means;

h. first and second manifold means connected to the first and second ends, respectively, of said cylindrical casing and to said plurality of concentric cylinders for creating a first and a second fluidic path through said annular spaces, said first fluidic path being between said first inlet means and said first outlet means, said second fluidic path being between said second inlet means and said second outlet means, said first fluidic path being formed by connecting every other annular space in series, starting from the annular space adjacent to the outermost annular space and proceeding to the innermost annular space, said second fluidic path being formed by connecting every other annular space in series, starting from the outermost annular space and proceeding to the annular space adjacent the innermost annular space.

3,907,029
STEAM GENERATOR

Heinrich Klein, Erlangen, and Eduard Weber, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1973, Ser. No. 392,523
Claims priority, application Germany, Sept. 4, 1972, 2243417
Int. Cl. F28f 9/22
U.S. Cl. 165—161 1 Claim



1. A steam generator including an upstanding, inverted U-shaped nest of tubes through which heating fluid is passed, said tubes having vertical legs, a horizontal circular tube sheet having holes formed therethrough and in which the lower ends of said legs are mounted, an enclosure for the tube sheet's upper surface and the tube nest for containing water and generated steam, means for flowing feed water into the enclosure radially inwardly from the periphery of the tube sheet and over the latter's upper surface for conversion to steam by upward flow therefrom through the tube nest, and means for flowing the heating fluid through the tube nests' tubes via the tube sheet's lower surface; wherein the improvement comprises means for reinforcing the inward radial flow force of the feed water to an extent preventing its conversion to steam locally adjacent to the central portion of the tube sheet and nest of tubes, said reinforcing means comprising a series of vertically interspaced annular plates having outer peripheral edges of substantially the same diameter all of which are positioned to receive the initial feed water flow via all of said edges, and having inner diameters which progressively increase from the uppermost one of said series downwardly to the lowermost one of the plates.

3,907,030
TUBULAR HEAT EXCHANGERS

Sidney Noel Victor Moss, Solihull, and Neville Theodore Ryder, Birmingham, both of England, assignors to Serck Industries Limited, Birmingham, England

Continuation-in-part of Ser. No. 122,455, March 9, 1971, abandoned. This application May 23, 1973, Ser. No. 363,102
Claims priority, application United Kingdom, Apr. 21, 1970, 18979/70
Int. Cl. F28b 9/00
U.S. Cl. 165—162 14 Claims

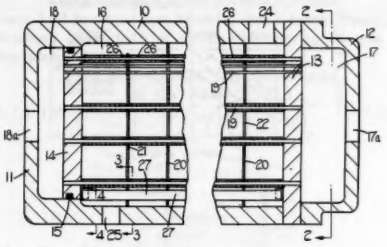
1. A tubular heat exchanger comprising the combination of a housing of generally cylindrical form;

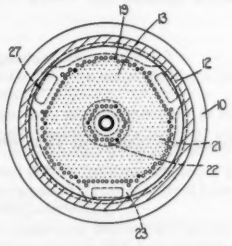
a pair of tube plates in the housing, one of which is free to move axially of the housing, said tube plates defining a center chamber in the housing and a pair of end chambers;

a matrix consisting of a plurality of light tubes joined to and extending between said tube plates and interconnecting said end chambers;

a plurality of baffles in spaced relationship on the tubes between the tube plates, said baffles slidably engaging the interior of the housing and defining a sinuous flow path over said tubes for a fluid flowing through said center chamber;

spacer means maintaining the baffles in spaced relationship; and at least one elongated reinforcing member which is of relatively substantial cross-sectional dimensions as





compared with the tubes so as to be relatively rigid as compared with the tubes, said reinforcing member being of non-circular cross-section and extending through complementary non-circular apertures in the baffles so as to prevent relative rotation between the baffles said reinforcing member being of a length relative to said tubes and functioning to define a minimum distance between said tube plates for preventing axial collapse of said tubes.

3,907,031

TUBULAR APPARATUS, IN PARTICULAR A STEAM GENERATOR

Helmut Tegethoff, Oberhausen, Germany, assignor to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany

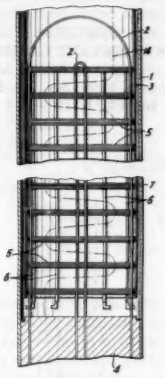
Filed Dec. 20, 1973, Ser. No. 426,573

Claims priority, application Germany, Dec. 21, 1972, 2262621

Int. Cl.[2] F28F *9/00*

U.S. Cl. 165—162 **3 Claims**

1. A spacer for the tubes of a heat exchanger, in particular a steam generator, having a tube bundle comprising a plurality of grating structures, each grating structure comprising a series of grating bars, a ring-shaped frame surrounding the tube bundle and having a series of bores formed in at least one face thereof and extending into said frame, and a series of grooves, one groove of said series corresponding with one of the bores of said series of bores and formed within said frame to intersect with the corresponding bore, and a plurality of sleeves for holding said grating bars, each of said sleeves



having a slot therein and rotatably mounted within one of said bores so that the slot is aligned with a respective groove.

3,907,032

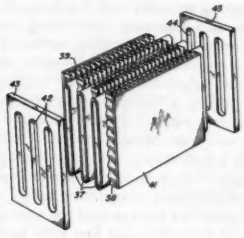
TUBE AND FIN HEAT EXCHANGER

Raymond S. DeGroote, and Joseph F. Fernandes, both of Centerville, Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Apr. 27, 1971, Ser. No. 137,827

Int. Cl. F28f *3/02*

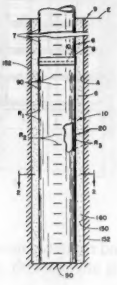
U.S. Cl. 165—166 **14 Claims**



1. A heat exchanger unit, including open ended tube means providing on each of opposite sides thereof a substantially continuous broad and flat external heat transfer surface, a strip of corrugated fin material mounted to each of said opposite sides and oriented to define a flow passage of selected direction externally of the tube means for a first fluid to flow over a respective side of said tube means, said tube means forming a flow passage internally thereof for a second fluid to flow from end to end thereof, a header plate at each end of said tube means forming at least one continuous slot accommodating a respective end of said tube means, and means uniting said tube means, said fin strips and said header plates into an integrated structure in which said fin strips are joined directly to said tube means, the ends of said tube means being accommodated in said header plate slots with limited freedom of relative self adjustment, said uniting means including de-

posited metal in said slots fixing the tube means relatively to said header plates and forming a seal and a bond between said tube means and the margins of said slots.

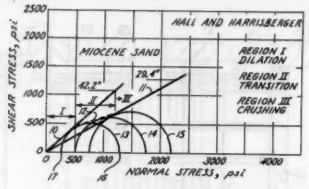
3,907,033
CORROSION RESISTANT LAMINATED PIPE
John A. Stuchlik, 1106 1st Ave. North, Aurora, Nebr. 68818
Filed June 4, 1973, Ser. No. 366,772
Int. Cl.[2] E21B *43/04*
U.S. Cl. 166—228 **8 Claims**



1. A well assembly comprising: a corrosionresistant pipe comprising a first elongated tube formed of synthetic resin containing fibers, said fibers being of a material which is bonded with said resin so as to reinforce said resin, said resin being a resin like fiberglass resin for use with fibers like fiberglass in the sense that it can be at first a liquid that later hardens after being mixed with a catalyst, and a second tube formed of a material the major portion of which is asbestos cement, said second tube being inside said first tube, said second tube having an outer wall adjoining the inner wall of said first tube, said adjoining walls being bonded together across the majority of their adjoining surface areas, the earth, said pipe being adapted for use in the earth, the earth having a certain portion adjacent to its outer surface, said certain earth portion having a well-opening extending downwardly into it from its outer surface, a porous material bordering said well opening, said pipe being disposed in said well-opening and serving as a well casing, said pipe having a plurality of perforations extending completely through both the first and second tubes thereof, said second tube having walls averaging at least seven times the thickness of the average thickness of the walls of said first tube, said first tube having an average thickness of at least one thirty-second of an inch, said second tube having an outer side having the area of a cylinder of a diameter between eight and eighteen inches.

3,907,034
METHOD OF DRILLING AND COMPLETING A WELL IN AN UNCONSOLIDATED FORMATION
George O. Suman, Jr., 3701 Kirby Dr., Suite 558, Houston, Tex. 77006
Continuation-in-part of Ser. No. 437,231, Jan. 28, 1974. This application Sept. 23, 1974, Ser. No. 508,031
Int. Cl.[2] E21B *43/00, 49/00*
U.S. Cl. 166—250 **9 Claims**

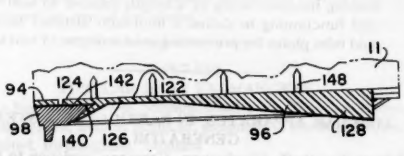
1. A method drilling and completing a well having a borehole penetrating an unconsolidated formation comprising the steps of determining the minimum pressure which must be exerted in the borehole against such formations to result in a radial effective stress on the borehole wall of not less than that value required to maintain the Mohr circle as defined by such radial stress and the maximum principal effective stress of the formation to be within the Mohr failure envelope for such



formation throughout at least Region I of said envelop; drilling said borehole into such formation; running a tubular member into the well; establishing fluid communication between said tubular member and said formation; and deliberately maintaining at least said minimum pressure continuously against said formation during all of said drilling, running and establishing steps.

3,907,035
Patent Not Issued For This Number

3,907,036
RACING TYPE HORSESHOE
Angelo W. Capone, 3146 Draper St., Philadelphia, Pa. 19136
Filed Mar. 21, 1974, Ser. No. 453,430
Int. Cl.[2] A01L *7/02*
U.S. Cl. 168—26 **15 Claims**



1. In a racing type horseshoe including a metallic horseshoe for affixing to a hoof, the combination of

A. an outer, horseshoe shaped pad in contact with the hoof, said outer pad being defined within an outer peripheral edge and an inner peripheral edge,
   a. said inner peripheral edge overlying a portion of the horseshoe,
   b. said pad defining an inwardly open clearance space between the hoof, the horseshoe and the said inner peripheral edge; and

B. a frog pad in contact with the hoof and having a top surface

1 said frog pad terminating outwardly in a peripheral ledge, said ledge positioning within the clearance space defined within the inner peripheral edge of the outer pad to enable the frog pad to be removed from the hoof without removing the horseshoe,

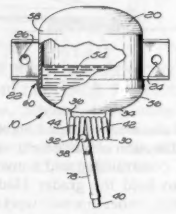
2. said frog pad including means to engage the horseshoe to removably retain the frog pad in engagement with the horseshoe.

3,907,037

DISPOSABLE FIRE EXTINGUISHER

Oronzo L. Linsalato, San Marino, and Edward Pesout, Jr., Newbury Park, both of Calif., assignors to Textron Inc., Providence, R.I.

Filed Aug. 5, 1974, Ser. No. 494,694
Int. Cl.² A62C *37/00*
U.S. Cl. 169—57 **7 Claims**



1. Fire extinguisher comprising:

A. a sealed container for housing a fire extinguishing fluid under pressure;

B. a discharge tube sealingly secured at one end to said container and communicating with the interior thereof;

C. closing means including a cap over the other end of said tube disposed remote from said container and closing said tube to prevent discharge of said fluid from said container during normal conditions;

D. thermally responsive means sandwiched between said cap and said tube securing said closing means to said discharge tube, said thermally responsive means becoming fluid upon application of heat thereto for a predetermined time thereby to release said closing means and discharge said fluid from said container; and

E. said discharge tube having a predetermined length sufficient to position said closing means remote from the bulk of fluid in said container by an amount to preclude said fluid from conducting heat by convection and conduction through said fluid away from said thermally responsive means and precluding release of said closing means within said predetermined time.

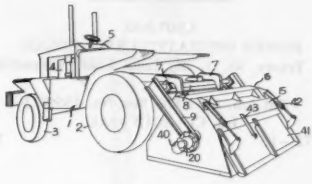
3,907,038

SELF-PROPELLED SOIL STABILIZER MACHINE

Albert W. Nelson, Springfield, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 398,315, Sept. 18, 1973, Pat. No. 3,865,175, which is a division of Ser. No. 269,228, July 5, 1972, Pat. No. 3,795,279. This application June 27, 1974, Ser. No. 483,885
Int. Cl.² A01B *63/112*
U.S. Cl. 172—9 **7 Claims**

1. A soil working machine having a chassis on which traction wheels, an engine, and a soil stabilizer unit comprising a vertically movable rotor are mounted, said soil stabilizer unit further comprising a rotor support frame connected to said chassis and on which said rotor is mounted, hydraulic actuator means connected between said chassis and said rotor support frame for vertically moving said rotor, a hydraulic fluid source, a hydraulic pump driven by said engine for supplying fluid from said source to said actuator means, and depth control means for said actuator to locate and maintain said rotor at a predetermined depth, said depth control means comprising a servo valve located on said machine for controlling hydraulic fluid flow from said pump to said hydraulic actuator means, said servo valve having two independently movable valve control shafts, said depth control means further



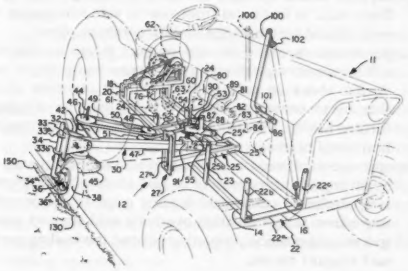
comprising manually operable adjustable means connected to one valve control shaft for controlling said hydraulic actuator means to locate said rotor at a predetermined depth, and further comprising mechanically operable adjustable means connected to the other valve control shaft and to said rotor and responsive to rotor position for maintaining said rotor at said predetermined depth.

3,907,039

TURF EDGING APPARATUS FOR TRACTORS AND THE LIKE

Charles G. Remley, 4451 Fairview Dr., Toledo, Ohio 43612; Harold E. Thebeau, Rt. 1, Silica Rd., Sylvania, Ohio 43560, and Raymond W. Medley, 1916 Price St., Toledo, Ohio 43605

Filed Oct. 5, 1973, Ser. No. 404,006
Int. Cl.² A01G *3/06*
U.S. Cl. 172—15 **12 Claims**



1. Apparatus for trimming and removing turf, grass, etc., along the margin of drives, walks, curbs and the like, said apparatus being adapted to be removably carried by a self-propelled vehicle such as a tractor, said apparatus including:

1. a frame including spaced means for releasable securement to said tractor,

2. a pivot arm carried by and pivotably secured to said frame on a pivot axis which is parallel to the path of said vehicle, said arm being constructed and arranged to extend laterally outwardly from said frame,

3. a freely rotatable disk carried dependingly on said arm, with the central plane of said disk vertically disposed, and,

4. means for supporting said pivot arm, said means providing vertically pivoting movement of said pivot arm about said pivot axis between an upper position wherein said

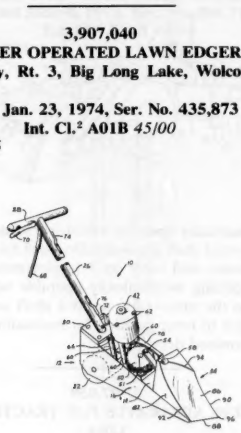
disk is out of contact with the ground and a lower operative position wherein the disk is at least ground level, said means including a vertically compressible spring constructed and arranged to be in compression when said pivot arm is in the lower operative position, said spring serving to absorb shock caused by contact of said disk with any obstruction in its path and transmitted to said pivot arm and thence to said spring.

3,907,040

POWER OPERATED LAWN EDGER

Von Aldo Trusty, Rt. 3, Big Long Lake, Wolcottville, Ind. 46795

Filed Jan. 23, 1974, Ser. No. 435,873
Int. Cl.[2] A01B *45/00*
U.S. Cl. 172—15 **8 Claims**



1. A device for digging furrows or the like comprising:

a ground engageable blade having a plow-like leading surface, the bottom part of said surface terminating in a leading edge;

support means upon which said blade is mounted for guiding and constraining the movement of said blade, said support means having a top surface sloping downwardly from back to front and from side to side whereupon the ends of said leading edge lie in a common plane;

roller means mounted on said support means so that said roller means may roll along the furrow being dug by said device about an axis parallel to said common plane, thereby to enable said device to be used for digging a furrow having a bottom surface which is substantially horizontal across its width;

motor operated means mounted on said support means for imparting vibratory motion to said blade of a sufficiently long stroke to cause said leading edge to reciprocably move from a first position overlying said support means to a second position projecting beyond the leading part of said support means.

3,907,041

GRADER-LEVELER ADAPTED FOR TRAILING BY TRACTORS

Gedalyahu Manor, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd., Haifa, Israel

Filed June 26, 1972, Ser. No. 266,078
Claims priority, application Israel, July 4, 1971, 37217
Int. Cl.[2] E02F *3/12*
U.S. Cl. 172—780 **14 Claims**

1. A grader-leveler comprising

a chasses (**3, 6**) having means at its forward end for trailing attachment to a farm tractor (**1**) and, at its rear end, means (**5**) for supporting the chassis above ground;

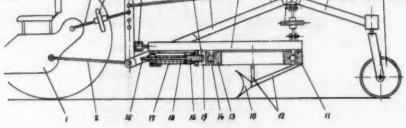
a normally horizontal turntable means (**11**), and means (13) securing the turntable means (**11**) to the chassis (**3, 6**) while permitting selective angular positioning thereof with respect to said chassis;

a grading and leveling blade (**10**) secured to the turntable means (**11**);

wherein the improvement comprises

quick-release and force overload means (**15, 16, 17**) locating the turntable means (**11**) and hence the blade (**10**) in angularly adjusted position with respect to the chassis (**3, 6**) comprising

a tooth element (**16''**) and a detent element (**15**), one of said elements being secured to the turntable means (**11**) and the other to the chassis (**3, 6**), said elements having respectively converging slide surface and being relatively movable for mutually releasable engagement with each other;



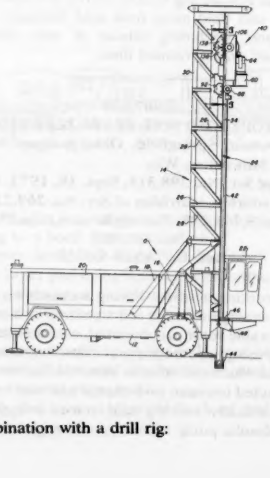
and releasable force means located on one of said elements, acting in the direction of movement on at least one of said elements and constraining said converging surfaces into engagement to hold the grader blade (**10**) in selected angular position under normal working conditions, but permit disengagement of said tooth and detent elements by relative sliding movement of said converging surfaces upon disengagement forces exerted by an overload on the blade as the result of an obstruction in excess of the engagement force exerted by said force means, the disengagement force being transmitted between the converging engaging slide surfaces of said elements.

3,907,042

TRAVERSE HEAD FOR ROTARY DRILL RIG

Larry E. Halwas, Garland, and Robert W. Hisey, Richardson, both of Tex., assignors to Gardner-Denver Company, Dallas, Tex.

Continuation of Ser. No. 447,694, March 4, 1974, abandoned.
This application Jan. 23, 1975, Ser. No. 543,215
Int. Cl.[2] B23Q *5/027;* **E21C** *5/00*
U.S. Cl. 173—160 **8 Claims**



1. In combination with a drill rig:

an elongated mast including a pair of spaced apart elongated beams and a gear rack mounted on each of said beams; and,

a traverse head for effecting longitudinal pulldown and hoisting movements of a drill stem with respect to said mast and characterized by:

a frame;

rotatable spindle means supported by said frame and connected to said drill stem;

bearing means disposed on said frame;

a shaft rotatably supported in said bearing means;

pinions mounted on opposite ends of said shaft and each engaged respectively with one of said racks;

drive means including a motor drivably connected to said shaft for driving said pinions to effect pulldown and hoisting movement of said traverse head and said drill stem; and,

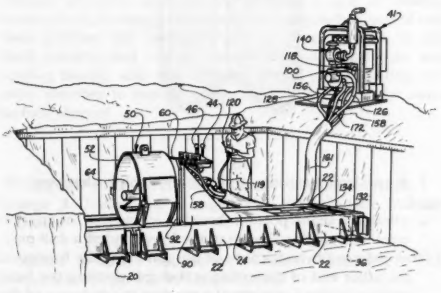
support means for supporting said drive means on said shaft and substantially independent of said frame.

3,907,043

HORIZONTAL BORING MACHINE WITH REMOTE PUMP CONTROL SYSTEM

William S. Appleman, Ashland, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio

Filed Mar. 27, 1974, Ser. No. 455,388
Int. Cl.[2] E01G *3/04*
U.S. Cl. 173—163 **6 Claims**



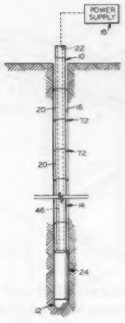
1. An earth boring machine comprising, in combination, track means; frame means including a main frame portion mounted for movement along said track means and an engine frame portion; an engine mounted on said engine frame portion; auger connecting shaft means mounted on said main frame portion; variable displacement pump means mounted on said engine frame portion and driven by said engine; a fluid motor mounted on said main frame portion for driving said auger connection shaft means; conduit means extending between said frame portion and forming a closed loop circuit between said pump means and said fluid motor; servo motor for varying the displacement of said pump means; pump control valve means for controlling a control flow of pressurized fluid to said servo motor, said valve means including a "center" position isolating said fluid motor from said control flow, a "right" position for delivering said control flow to one side of said servo motor, and a "left" position for delivering said control flow to the other side of said servo motor; a servo actuator including an electric motor for said pump control valve means for shifting said valve means between said positions; and a remote electric controller for controlling the rotation of said auger, said controller being electrically connected to said electric motor of said servo actuator and operable from a location remote from said machine.

3,907,044

GEOPENETRATOR SYSTEM

Alan L. Robertson, Newington, Conn., assignor to United Research & Development Company, Incorporated, Newington, Conn.

Filed Sept. 19, 1974, Ser. No. 507,344
Int. Cl.[2] E21B *7/00*
U.S. Cl. 175—16 **10 Claims**



1. A geopenetrator system operable for drilling a hole into the earth several miles deep comprising:

a. a penetrator head for forming a hole in a substance by burning including a housing, a forerunner affixed to one end of said housing, energy transmitting means extending through said housing into engagement with said forerunner and operable for heating said housing and forerunner, and means formed in said housing operable for use in withdrawing the geopenetrator system from a hole thereof by pushing the geopenetrator system therefrom;

b. extendible pipe casing means having a lesser diameter than the diameter of said housing and being extendible in length so as to be capable of reaching from said housing of said penetrator head to the top of the hole being drilled;

c. overlock means interconnecting one end of said extendible pipe casing means to the other end of said housing so as to form a smooth transition between the larger diameter of said housing and the smaller diameter of said extendible pipe casing means, said overlock means cooperating with a portion of the sidewalls of the hole being drilled located above said penetrator head so as to form an overlock therewith operable to inhibit the passage of trapped liquids and gases encountered while drilling the hole from passing upwardly through the hole to the top thereof whereat these liquids and gases could pose a danger to the personnel working the drilling rig during the drilling operation; and

d. power means operatively connected to said energy transmitting means providing a source of power thereto to cause said energy transmitting means to become heated.

3,907,045

GUIDANCE SYSTEM FOR A HORIZONTAL DRILLING APPARATUS

Herbert Douglas Dahl, and Tibor O. Edmond, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

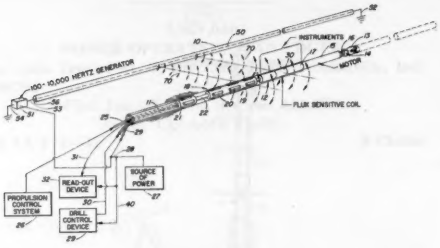
Filed Nov. 30, 1973, Ser. No. 420,409
Int. Cl.[2] E21B *47/00*
U.S. Cl. 175—45 **2 Claims**

1. In an apparatus for boring an elongated generally horizontal borehole where the drilling apparatus contains a directional drilling control apparatus, a means for maintaining a second borehole being bore parallel to a first borehole already bored, comprising:

a flux-sensitive coil having its axis oriented normal to said apparatus for boring;

a signal generating means having a pair of terminals;

antenna means disposed insulatively along the length of said first borehole, having one end grounded and the remaining end connected to one of said terminals with said remaining signal generating means terminal being connected to ground;



means connecting said flux-sensitive coil to a readout means which indicates maximum voltage response; and

means coupled to said directional drilling control apparatus for directionally controlling said drilling apparatus responsive to said measured flux magnitude from said readout apparatus to maintain maximum response.

3,907,046

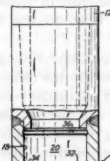
RECLOSABLE DOWNHOLE BYPASS VALVE

Eber W. Gaylord, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 532,749

Int. Cl.[2] E21B *27/00, 41/00*

U.S. Cl. 175—235 **9 Claims**



1. A downhole bypass valve for connection into the lower end of a drill string above a drill bit comprising a tubular body adapted to be connected into the drill string for rotation therewith, said tubular body having an inner wall surrounding a bore extending longitudinally therethrough, a port extending laterally through the tubular body, a tubular mandrel slidable in the tubular body below the port and extending from the lower end of the tubular body for suspension of the drill bit, spline means adapted to prevent rotation of the mandrel relative to the tubular body, a sleeve slidable in the tubular body above the mandrel from an upper position exposing the port to the bore of the tubular body to a lower position covering the port, a valve seat around the inner wall of the tubular body between the upper end of the mandrel and the port, and a valve head in the bore, said valve head being constructed and arranged to engage the valve seat to prevent flow through the bore and being deformable to pass through the valve seat on application of a predetermined force urging the valve head against the valve seat.

3,907,047

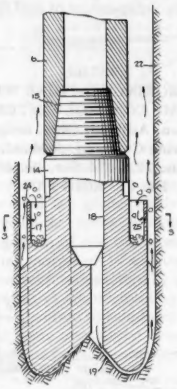
INTEGRAL JUNK BASKET FOR DRILL BIT

Charles T. Thompson, Dallas, Tex.; Frank B. Kidd, New Iberia, La., and Lawrence W. Diamond, Richardson, Tex., assignors to American Coldset Corporation, Dallas, Tex.

Filed Apr. 23, 1974, Ser. No. 463,278

Int. Cl.[2] E21B *31/08*

U.S. Cl. 175—312 **10 Claims**



1. A combination rotary drill bit and junk basket comprising:

a cylindrical shank portion threaded at one end for engagement with mating threads at the lower end of a drill pipe; an enlarged cylindrical head portion integrally formed at the other end of the cylindrical shank portion, the head portion having a diameter larger than the diameter of the shank portion and a plurality of circumferentially spaced, longitudinally extending lands formed on the head portion, with discrete hard cutting elements embedded in the end of the head portion and on the outer surfaces of the lands for drilling a bore hole larger than the diameter of said head;

a cylindrical shell portion surrounding the shank portion, the shell having an outer diameter equal to the diameter of the head portion and an inner diameter larger than and radially spaced from the shank portion;

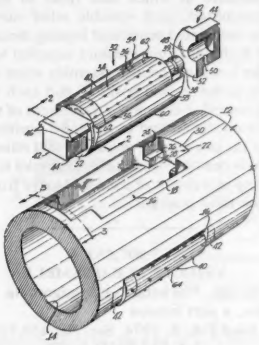
means for attaching one end of the cylindrical shell portion to the drill bit so that the shell portion forms an integral constant diameter, smoothly faired skirt-like extension of the head portion, with the space between the shell portion and the shank portion defining an annular cup opening toward the threaded end of the shank portion; and

a passageway through the center of the drill bit opening to the cutting end of the head for conducting drilling fluid supplied from the drill pipe to the cutting end of the bit and thence upward between the outer surface of the enlarged head and the wall of the bore hole, the constant diameter of the head and skirt causing substantially constant flow velocity until the stream of fluid passes the skirt lip, thereby tending to prevent junk entrained in the stream from falling back until it has passed the lip of the cup.

3,907,048
AIR CLEANED AND LUBRICATED STABILIZER

Gary D. Gray, Calgary, Canada, assignor to Bralorne Resources Limited, Calgary, Canada

Filed Nov. 1, 1974, Ser. No. 520,193
Claims priority, application Canada, May 13, 1974, 199603
Int. Cl.² E21B 17/10; E21C 9/00
U.S. Cl. 175—325 7 Claims

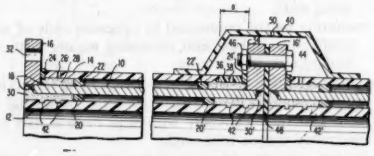


1. A rotary stabilizer assembly for insertion into a compatible receptacle in a stabilizer body, comprising a generally cylindrical roller stabilizer member having a shaft portion of reduced diameter at each end thereof, a pair of bearing blocks, each bearingly supporting a corresponding one of said shaft portions and having means for directing fluid to said shaft portion, and a tray member extending between said bearing blocks, said tray member partially surrounding said roller member to expose a longitudinal portion of the outer surface thereof.

3,907,049
LINED PIPE AND METHOD OF MAKING SAME

George J. Baffas, 44 Evangelistrias Str, Glyfada, Athens, Greece

Filed Jan. 25, 1974, Ser. No. 436,816
Claims priority, application Greece, May 15, 1973, 1960/16/88; Sept. 12, 1973, 2749/21/3
Int. Cl.² F16L 9/22
U.S. Cl. 138—155 18 Claims

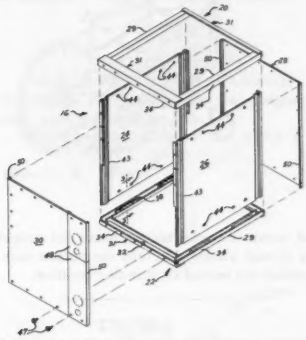


1. Fluid transporting means comprising in combination:
a metal pipe;
an inner pipe of plastic which fits within said metal pipe so as to provide a predetermined clearance space between the opposed surfaces of said metal and said inner pipes, a plurality of annular rings of cementitious material at spaced locations between said metal pipe and said inner plastic pipe,
an outer pipe of plastic which fits over said metal pipe so as to provide a predetermined clearance between the opposed surfaces of said metal and said outer pipes,
and a further plurality of annular rings of cementitious material at spaced locations between said metal pipe and said outer plastic pipe.

3,907,050
HEAT EXCHANGER HOUSING

Donald M. Mullings, Yardley, Pa., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 19, 1974, Ser. No. 443,407
Int. Cl.² F16L 9/00; F24F 13/00; F25D 19/00; B65D 7/00
U.S. Cl. 138—157 3 Claims



1. A housing for use with a forced air furnace comprising:
rectangular top and bottom frame members of common configuration providing air inlet and outlet openings for said housing, each of said frame members having a base portion and a peripheral wall extending laterally from said base portion;
two opposite substantially flat side panels of common configuration and a substantially flat first end panel each having lower and upper edge portions;
guide means mounted on said base portions of said lower and upper frame members, including wall portions parallel to and spaced from said peripheral wall for positioning and holding the lower and upper edge portion of said side panels in intimate contact with said peripheral wall;
locking means including tab means on one of either said edge portions or said frame members, and arranged to engage slot means on the other of said edge portions or said frame member for securing said side panels to said frame members and means for trapping and holding said first end panel between said frame members; and
a substantially flat second end panel mountable opposite said first end panel to complete the peripheral side walls of said housing.

3,907,051
STAND-UP WHEELCHAIR

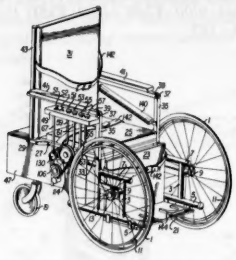
Charles M. Weant, Annapolis, and Arthur Schwartz, Edgewater, both of Md., assignors to Arthur Schwartz, Edgewater, Md.

Division of Ser. No. 236,268, March 20, 1972, Pat. No. 3,807,795. This application Apr. 19, 1973, Ser. No. 352,495
Int. Cl.² B62D 11/00
U.S. Cl. 180—6.2 22 Claims

1. An invalid mobility device comprising:
a. a frame,
b. an invalid supporting means including a seat pivoted to said frame and a back pivotally supported to said seat,
c. means for raising and lowering a person from a substantially seated position to a substantially standing position by pivoting said seat from a horizontal position to a generally vertical position and wherein said back remains generally vertical and moves upwardly with said seat, whereby the person's buttox and back are supported in both the seated and standing position,

d. a motor on said frame for operating said raising and lowering means,

e. a plurality of wheels on said frame for permitting movement of the device over a surface, and wherein



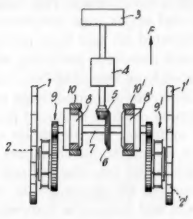
f. said motor is connected to means for propelling at least one of said wheels, whereby the person may move about in either the seated or standing position.

3,907,052

STEERING SYSTEMS FOR TRACKLAYING VEHICLES

Daniel J. C. Shaw, Elvington, England, assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 356,273, May 1, 1973, Pat. No. 3,815,631.
This application Mar. 21, 1974, Ser. No. 453,228
Claims priority, application United Kingdom, May 4, 1972, 20703/72
Int. Cl.[2] B62D *11/08*
U.S. Cl. 180—6.7 **7 Claims**



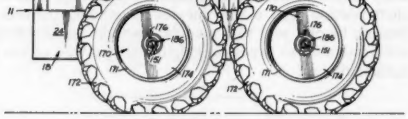
1. A track-laying vehicle comprising a pair of tracks, a pair of drive wheels each driving a respective one of the tracks, a pair of clutches each for transmitting power to a respective one of the drive wheels, clutch cylinders for operating the clutches, a pair of brakes each for braking a respective one of the tracks, brake cylinders for operating the brakes, a source of hydraulic fluid pressure, and a control assembly for controlling the supply of fluid to said clutch and brake cylinders, said hydraulic pressure source having a first supply line connecting same to the clutch and brake cylinders associated with a respective one of the tracks, and a second supply line connecting said source to the clutch and brake cylinders associated with the other of the tracks, said control assembly including a pair of spool valves and a pair of variable relief valves, said assembly arranged with a first of the said spool valves in the first supply line for controlling the supply of hydraulic fluid to the clutch and brake cylinders concerned, and a second of the said spool valves in the second supply line for controlling the supply of hydraulic fluid to the clutch and brake cylinders concerned, each spool valve having three operating positions: a first position in which the brake is disengaged, a second position in which the clutch is disengaged and the brake is disengaged, and a third position in which the clutch is disengaged and the brake is engaged, said assembly further arranged with a first of the said variable relief valves in the first supply line and a second of the said variable relief valves in the second supply line, said variable relief valves each having tensioned biasing means controlling the pressure at which each relief valve permits relief of the hydraulic fluid pressure in the different ones of the supply lines, the tensioned biasing means of each variable relief valve being associated with one spool valve, so that movement between certain positions thereof causes increased tensioning of the biasing means and increasing pressure at which said relief of hydraulic fluid pressure is permitted, each variable relief valve being controlled by the associated tensioned biasing means for permitting relief of hydraulic fluid pressure supplied to a respective brake cylinder from said control assembly when the associated spool valve is in the second position, and each variable relief valve being controlled during the movement of the associated spool valve from the second to the third position to increase progressively the pressure at which the said relief of hydraulic fluid pressure is permitted, whereby the brake is progressively engaged during movement of the spool valve from the second position to the third position.

3,907,053

VEHICLE SUBASSEMBLY

Donald D. Savage, Marietta, Ga., assignor to B. J. Powell, Atlanta, Ga., a part interest

Filed Feb. 5, 1974, Ser. No. 439,736
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 **22 Claims**



1. A vehicle subassembly comprising:

a base frame including:

a pair of spaced apart side rails generally parallel to each other,

a pair of spaced apart torque tubes connecting said side rails and oriented generally perpendicular to said side rails and along spaced apart, generally parallel central axes, and

mounting means connected to opposite ends of each of said torque tubes, said mounting means further connected to said side rails;

drive means carried by each of said mounting means including a projecting drive shaft extending outwardly therefrom generally coaxially with said central axis of said associated torque tube; and,

a ground engaging wheel and tire assembly mounted on each of said drive shafts for supporting and propelling said subassembly.

3,907,054

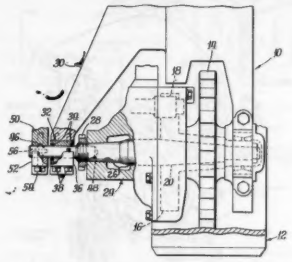
DIAGONAL BRACE BEARING FOR CRAWLER-TYPE TRACTORS

Ronald E. Lavish, Bartonville, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed June 13, 1974, Ser. No. 479,098
Int. Cl.[2] B62D *55/00*
U.S. Cl. 180—9.6 **3 Claims**

1. In a tractor having a body and a roller frame for supporting a continuous track chain, a drive sprocket for rotating said track chain and means for mounting said drive sprocket on

said roller frame, said drive sprocket rotatably mounting a main sprocket shaft, a drive casing for housing said main sprocket shaft, a stub shaft coaxial with said main sprocket shaft, a diagonal brace secured to said roller frame and to said stub shaft, a bearing, a bearing cap, said diagonal brace extending inwardly and rearwardly in relation to said tractor body and cooperating with said bearing cap to removably mount said bearing in a journaling relation to said stub shaft, the improvement comprising: means releasably connecting



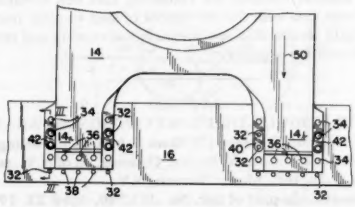
said stub shaft directly to one end of said main sprocket shaft, said connecting means forming a single sprocket shaft out of said main sprocket shaft and said stub shaft for a supportive connection to said diagonal brace, said bearing comprising a single-piece cylindrical sleeve with complementing single-piece annular seals on opposite ends thereof and being secured by said bearing cap to said diagonal brace, said single-piece cylindrical bearing being rotatably received on said stub shaft.

3,907,055

GAUGE MODIFIER FOR AN EXCAVATOR

August Herman Bertram, and Stephen Harold Gill, both of Aurora, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed May 31, 1974, Ser. No. 474,977
Int. Cl.[2] B62D *55/00*
U.S. Cl. 180—9.48 **9 Claims**



1. A track gauge modifier assembly for a track vehicle having a lower frame including a pair of arms extending outward from each side for connecting to a pair of spaced track roller frame members, the improvement comprising:

adjustable connecting means for adjustably connecting one of said roller frame members to the lower frame member relative to the other roller frame member;

said connecting means comprising a plurality of bolt receiving bores extending through said arms, a plurality of bolt receiving holes formed in said roller frame members and a slot formed in each of said arms spanning a plurality of said holes in said roller frame members in any one of a selected position of adjustment extending in the direction of said adjustment, and terminating at ends defining the innermost and outermost position of said adjustment;

locking means comprising an elongated member having a main body portion extending into said slot means for holding said members in said adjusted position;

bolt receiving bores in said elongated member for alignment with said plurality of holes spanned by said slot; and,

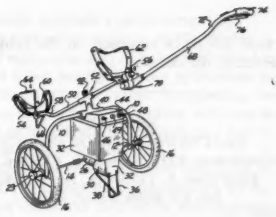
guiding means comprising a cylindrical projection extending from the side of said elongated member opposite said main body portion engaging said slot for guiding said frame members between adjusted positions.

3,907,056

ELECTRIC GOLF BAG CARRIER

Truman A. Thomas, III, Birmingham, Ala., assignor to Electric Golf Carts, Inc., Birmingham, Ala.

Filed June 13, 1974, Ser. No. 479,171
Int. Cl.[2] B62D *51/04*
U.S. Cl. 180—19 R **8 Claims**



1. A powered carrier for bags comprising: an axle; a pair of wheels drivingly connected to the opposed ends of the axle; a generally U-shaped yoke member having its two ends journalling the shaft at spaced points, one adjacent to each wheel, so that the central section of the yoke extends parallel to and spaced from the axle; a power unit affixed to the yoke so as to be disposed between the yoke and the axle including a battery, an electric motor, and a gear reduction unit having an input shaft driven by the electric motor and a double-ended output shaft forming the center section of the axle; a rest member affixed to the power unit and providing, along with the wheels, a three-point ground support for the carrier; and an elongated bag support and handle member pivotably supported on the yoke member at the midpoint of its central section, on the side opposite to the axle, so as to be disposable in a first, operative position wherein it extends normally to the central section of the yoke and the axle, and a second, folded position wherein it extends parallel to the central section of the yoke and to the axle.

3,907,057

CROSSWISE MUFFLERS

Aaron Reddekopp, Portland, Oreg., assignor to Reddekopp Muffler & Truck Equipment, Inc., Portland, Oreg.

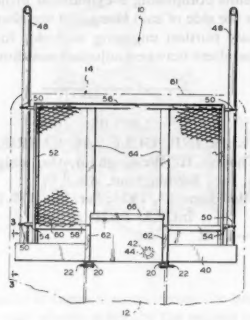
Filed May 20, 1974, Ser. No. 471,196
Int. Cl.[2] B60K *13/00*
U.S. Cl. 180—64 A **7 Claims**

1. In a crosswise muffler adapted to be mounted on a chassis of a truck tractor,

a rigid tubular, horizontal base and muffler means having ends and outlets at ends thereof and adapted to be secured to the chassis behind a cab,

cabguard frame means secured to the base and muffler

means in a vertical position forming a headboard covering at least a substantial portion of the cab,



and vertical tail pipes mounted on the frame means and connected to the outlets.

3,907,058

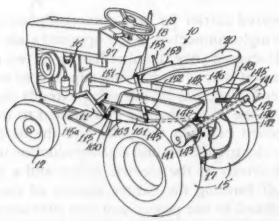
TRACTION CONTROL DEVICE

Ralph R. Gunderson, 8212 S. Homan, Chicago, Ill. 60652

Filed Mar. 5, 1973, Ser. No. 337,917

Int. Cl. B60k *23/04, 29/00*

U.S. Cl. 180—74 **16 Claims**



1. In a vehicle having a chassis with propelling wheels connected by a differential, a torque transfer device operable from an operator's station on the vehicle for connecting the propelling wheels directly to transfer torque from one wheel to the other when the differential permits relative rotation between the wheels, comprising: a torque transfer assembly including a rotatable shaft, friction elements fixed on the shaft and spaced apart axially to engage the propelling wheels of the vehicle, and bearing means rotatably supporting the shaft at spaced position between the friction elements on the shaft; lever means pivotally secured to the chassis and connected to the torque transfer assembly for moving the friction elements of said assembly toward and away from the propelling wheels, the lever means including an actuating means adjacent the operator's station movable between an inoperative position in which the friction elements are spaced from the propelling wheels and an operative position in which the friction elements engage the propelling wheels; and spring means for normally urging the assembly away from the propelling wheels so that the actuating means is in inoperative position.

3,907,059

PASSIVE MOTION ARRESTING PROTECTIVE DEVICE OF SHOULDER ARM TYPE

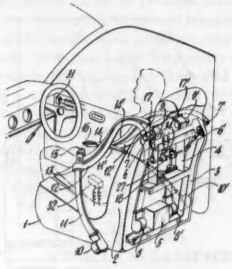
Takeo Takada, deceased, late of Tokyo, Japan, and by, Juichiro Takada, legal representative, Tokyo, Japan, assignors to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,376

Claims priority, application Japan, Dec. 5, 1972, 47-121199

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C **10 Claims**



1. A safety belt mechanism in a vehicle having a seat adapted to accommodate an occupant, a first lap belt movable from a point at a first side of said seat between an extended and a retracted position and normally urged toward a retracted position, a first coupling member mounted on said belt proximate its free end, a second coupling member adapted to releasably engage said first coupling member and connected to a point at the second side of said seat opposite to said first side and transfer means for advancing said coupling members into mutual engagement and comprising a first transfer member including a transverse upper portion extending above the shoulder level of a seat occupant and a forward portion depending from the forward part of said upper portion, means supporting the rear part of said upper portion, whereby said transfer member is swingable about a first vertically extending axis laterally offset from the medial axis of said seat between a retracted position with the lower portion of said transfer member being disposed proximate said seat first side and an advanced position forwardly and inwardly of said retracted position, first belt advancing means located on the lower part of said transfer member for extending said belt toward said second seat side with the movement of said transfer member toward said second side and means for advancing and retracting said transfer member.

3,907,060

MOTOR VEHICLE THEFT-PREVENTION APPARATUS

Albert C. Burton, Brewster; William E. McGraw, Hastings-on-Hudson, and Thomas V. Savino, Ossining, all of N.Y., assignors to Cahs, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 353,740, April 23, 1973, abandoned, which is a division of Ser. No. 233,179, March 9, 1972, abandoned. This application Jan. 30, 1974, Ser. No. 437,730

Int. Cl.² B60R *25/04*

U.S. Cl. 180—114 **1 Claim**

1. In a motor vehicle having a fuel tank, a fuel pump, and fuel atomizing means, apparatus for securing the vehicle when parked, comprising in combination:

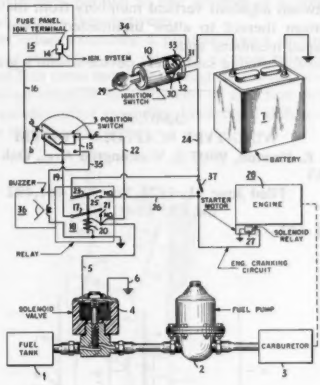
a. an electrically actuated fuel valve arranged in the fuel line between said fuel tank and said fuel pump; and

b. valve actuating means, electrically connected to said fuel valve, for applying a voltage to operate said fuel valve, said valve actuating means comprising:

i. a multi-throw switch, arranged on said motor vehicle and hidden from view, having a detent on position, a detent off position, and a momentary on position;

ii. a first electrical connection between said multi-throw switch and a source of voltage on the switched side of the ignition system of said motor vehicle; and

iii. a second electrical connection between said multi-throw switch and said fuel valve, said second connection including relay means, connected to said source of voltage, said multi-throw switch and said fuel valve, having a self-holding contact for maintaining the electrical connection between said multi-throw switch and said fuel valve, once actuated, as long as said source of voltage is present.



3,907,061

GAS-CUSHION VEHICLES

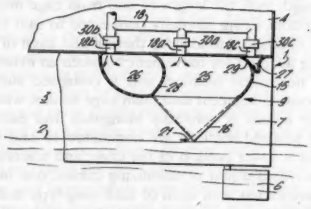
John H. Chapman, Fareham, England, and Ronald Christopher Fishlock, Toronto, Canada, assignors to Hovermarine Transport Limited, Southampton, England

Filed Sept. 18, 1973, Ser. No. 398,558

Claims priority, application United Kingdom, Sept. 18, 1972, 43129/72

Int. Cl.² B60V *1/11*

U.S. Cl. 180—117 **3 Claims**



1. A gas-cushion vehicle provided with a flexible skirt of hollow, inflatable form having an upper and lower stage, said skirt being attached to and depending from the vehicle body so as to contain, in operation of the vehicle, and at least in part, the vehicle-supporting cushion, the upper stage comprising three inflatable compartments disposed in tandem and separated from each other by laterally-disposed flexible wall means, the lower stage comprising a plurality of flexible skirt members defining cavities open to the central compartment of the upper stage, and skirt distorting means for distorting the upper stage laterally so as to move the flexible skirt towards and away from the surface over which the vehicle travels as well as laterally relative to said surface, said skirt distorting means comprising means for inflating the three compartments of the upper stage to differing pressures.

3,907,062

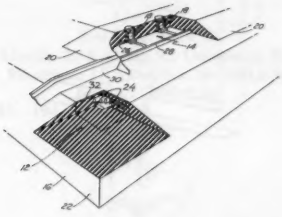
COMPLIANT BLANKET ACOUSTIC BAFFLE

Gerald A. Brigham, Anaheim, Calif., and John J. Libuha, Old Lyme, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,461

Int. Cl.² G01S *3/00*; G01V *1/00*

U.S. Cl. 181—.5 **4 Claims**



1. An acoustic isolation system comprising:

a compliant blanket acoustic baffle having a compliant material with a plurality of tubes embedded in said material, said tubes are rigid under hydrostatic pressure and compliant to specific noise frequencies, said material having an inner and outer surface with said inner surface adapted to be affixed to the hull of a vessel, said outer surface affixed to a plate; and

a hydrophone system disposed on said plate so as to have said baffle intercept noise frequencies on the side of the said inner surface of said baffle, said hydrophone system comprising a compliant material having a plurality of spaced hydrophones embedded therein.

3,907,063

NON-FLAMMABLE PAPER FOR SPEAKER CONES

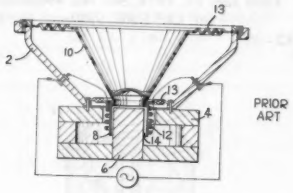
Masahiko Nakazawa; Shizuo Nakamura, and Mutumi Nakayama, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed July 17, 1974, Ser. No. 489,156

Claims priority, application Japan, July 19, 1973, 48-81162

Int. Cl.² G10K *13/00*; H04R *7/00*

U.S. Cl. 181—169 **9 Claims**



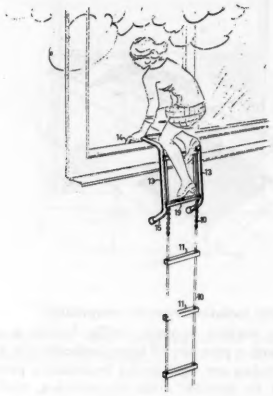
1. In a loudspeaker of the type which comprises a speaker diaphragm or cone adapted to generate sonic and/or subsonic vibrations in response to an electrical signal, the improvement which comprises: said diaphragm or speaker cone is made of cellulose fiber paper containing uniformly distributed therein (1) from 10 to 50 parts by weight of particles of chlorinated polyolefin having a molecular weight of from 500 to 40,000 and a chlorine content of from 40 to 75 percent by weight and (2) from 5 and 40 parts by weight of particles of antimony trioxide, the amounts of (1) and (2) each being based on 100 parts by weight of cellulosic fibers, whereby said diaphragm or speaker cone is non-flammable.

3,907,064

EXTENDABLE ESCAPE LADDER

Hans Erik Svalberg, and Erik Arnold Svalberg, both of Brahegaten 24, S-114 37 Stockholm, Sweden

Filed Nov. 2, 1973, Ser. No. 412,410
Int. Cl. E06c 1/34, 1/56
U.S. Cl. 182—70 5 Claims



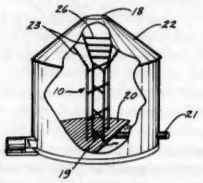
1. An extendable ladder comprising a pair of flexible side members, a plurality of rungs extending between said flexible side members, a magazine for said ladder, said magazine comprising two parallel U-sections that open toward each other for slidably receiving the ends of said rungs for storing the ladder in a collapsed condition, a pair of rigid spacing members extending between and interconnecting said U-sections and constituting the top two rungs of the ladder, the upper of said spacing members comprising a fixed end wall closing said magazine, and movable means for selectively opening and closing the other end of the magazine, said movable means being mounted on and extending between said rigid spacing members.

3,907,065

GRAIN BIN SAFETY DEVICE

Vincent B. Steffen, 321 E. Hamilton, New Hampton, Iowa 50659

Filed July 19, 1974, Ser. No. 490,116
Int. Cl.² E06C 9/00
U.S. Cl. 182—95 10 Claims



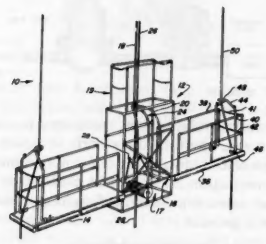
1. A safety device for a grain bin comprising:
four vertical members having top and bottom ends;
a first horizontally disposed substantially X-shaped brace having the ends thereof rigidly affixed to respective ones of said vertical members near the top thereof;
a second horizontally disposed substantially X-shaped brace having the ends thereof rigidly affixed to respective ones of said vertical members near the bottom thereof;
a third horizontally disposed substantially X-shaped brace having the ends thereof rigidly affixed to respective ones of said vertical members intermediate the top and bottom thereof;
each respective one of said first, second and third X-shaped braces lying substantially in one plane;
a continuous vertical completely open space being formed between adjacent vertical members from the top to the bottom thereof to allow unimpeded access to the X-shaped members; and
means for affixing said safety device within a grain bin.

3,907,066

WING-TYPE SCAFFOLD SYSTEM

Robert E. Newton, 9807 S. Washington Ave., Oak Lawn, Ill. 61943

Filed June 21, 1974, Ser. No. 481,492
Int. Cl.² E04G 3/10
U.S. Cl. 182—112 4 Claims



1. A scaffold system for use in constructing or maintaining a building which includes platform means, hoist cable means connected to the platform means and the building for raising and lowering the platform and safety cable means connected to the platform and the building for preventing accidental downward movement of the platform, wherein the improvement comprises said platform means including: main cage means connected to said hoist cable means and said safety cable means; and a pair of elongated wing-type scaffold sections, each of said wing-type sections being of substantially greater length than the length of said main cage means, each of said sections being pivotally connected to said main cage means on opposite lateral sides thereof and each of said sections being adapted for movement between an extended substantially horizontal position and a collapsed substantially vertical position adjacent said main cage means; wherein said main cage means is vertically elongated and each of said wing-type scaffold sections are connected to said cage at a position on a lower portion of the cage; and wherein there is further provided a pair of stabilizing cables, one member of the pair associated with each of said wing-type scaffold sections, with each cable connected to the section adjacent the outboard end thereof, and each cable being adapted to prevent accidental downward movement of the scaffold so as to prevent pivoting of the entire scaffold.

3,907,067

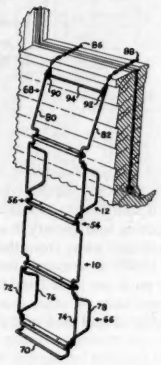
FOLDING LADDER

Thomas B. Kennedy, 3175 Pickbury Dr., Cincinnati, Ohio 45211

Filed Dec. 17, 1973, Ser. No. 425,067
Int. Cl.² E06C 1/38
U.S. Cl. 182—164 7 Claims

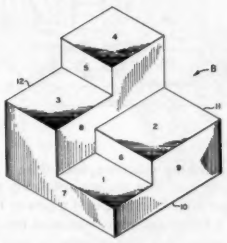
1. A ladder foldable for storage inside a building and extendible along a wall of said building to permit egress therefrom, the ladder comprising:

a. a plurality of rigid first sections, each first section including a pair of first elements and a first cross member, each first element having
1. an eye at a first end,
2. the other end of each first element being joined to said first cross member, which maintains said first elements approximately parallel to one another at a predetermined spacing therebetween,
3. a first offset extending a predetermined inward distance at said other end, said first element being joined to said first cross member through this offset, and
4. a second offset at said first end of said first element, said second offset extending inwardly a different distance than the first offset;



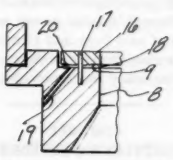
b. a plurality of rigid second sections, each second section including a pair of second elements and a second cross member, said second element including
1. a first piece having an eye at a first end and having the other end joined to the second cross member which maintains said second elements approximately parallel to one another at said predetermined spacing therebetween, the length of said first piece being approximately equal to the length of said first element,
a first offset extending a predetermined inward distance at said other end of said first piece, said first piece being joined to said second cross member through this offset, this offset being approximately equal to the first offset of the first element, and a second offset at said first end of said first piece, the magnitude thereof being approximately equal to the second offset of said first element, and
2. a second piece rigidly connected to the first piece, said second piece having a base for engaging the wall of said building and providing a bearing surface thereagainst, and two sides, the sides forming obtuse angles with said base and being rigidly connected to the first piece;
c. alternate first and second sections being connected together as a chain of sections by first and second pairs of pivoted connections, the eyes of the first pieces of second sections receiving the first cross members of first sections to form the first pairs of pivoted connections, the eyes of the first elements receiving the cross members of second sections to form the second pairs of pivoted connections;
d. said first and second cross members comprising inflexible pieces having lengths approximately equal to the predetermined spacings between the respective pairs of elements;
e. covering means rigidly connected to and covering each respective cross member, said covering means having a tread surface providing a ladder step, said covering means comprising
1. a supporting member rigidly connected to the respective pair of elements, parallel to the cross member therebetween but spaced from the cross member by a gap,
2. a covering member hollowed out for receiving the supporting member and the adjacent cross member, and
3. fastening means passing through said gap and rigidly connecting the covering member to the respective section, and
f. means for securing the chain of sections to said building.

3,907,068
LADDER BLOCK
Walter T. Ulerich, 23 E. Craig St., Uniontown, Pa. 15401
Filed June 21, 1974, Ser. No. 481,639
Int. Cl.[2] E06C *1/00*
U.S. Cl. 182—194 **2 Claims**



1. A ladder block having a plurality of steps of sufficient size to stand thereon, including a pair of steps along one side to give two step levels and integral with a pair of steps of greater height on the other side thereof to give two additional higher step levels, making a total of four step levels surrounded by four flat, stepped sidewalls, a common rectangular base underlying all four of said step levels, additional levels being provided by tilting the block by 90° so that at least two of said sidewalls may be used selectively as the base surface resting on the floor so as to give a total of nine step levels.

3,907,069
DIE WITH LUBRICATING SYSTEM FOR THE EXTRUSION OF BILLETS
Michael J. Pryor, Woodbridge, and James E. Dore, Milford, both of Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland
Filed June 17, 1974, Ser. No. 480,047
Int. Cl.[2] F16N *1/00*
U.S. Cl. 184—6 **6 Claims**



1. In a press for the hot extrusion of aluminum and aluminum alloys having a cylindrical container, an extrusion die with a flat face at one end of said container, and a movable piston within said container at its other end, the improvement which comprises: a metal plate positioned within said container adjacent to said die and conforming thereto, means for attaching said plate to said die, said plate having a flat face adjacent to said die face, at least one of the adjacent plate and die faces having a knurled surface means to furnish a passageway in the region therebetween, and conduit means in said die

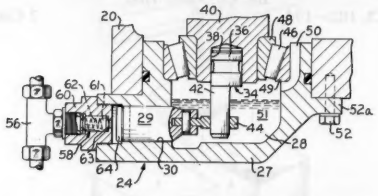
for supplying lubricant to said region between the metal plate and the die face, whereby to provide lubricant for aiding the extrusion of a billet through said die.

3,907,070

LUBRICATING APPARATUS FOR EXCAVATOR BRAKE ASSEMBLY AND SWING ASSEMBLY AND SWING TRANSMISSION

Michael Edward Cheek, Oswego, and Allan Leslie Freedy, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Dec. 9, 1974, Ser. No. 531,002
Int. Cl.² F01M *9/00*
U.S. Cl. 184—6.13 **6 Claims**



1. In an earth-working machine, including a mobile undercarriage, an upper unit and means rotatably mounting said upper unit on said undercarriage and a power transmission, a drive motor and a brake assembly mounted on said upper unit to power rotate said upper unit relative to said undercarriage with said power transmission and said brake assembly being within a housing rigidly attached to said upper unit, an improved lubricating apparatus for said power transmission, comprising:

a sump defined by the bottom of said housing and a case removably sealingly secured therebelow, the bottom of said case serving to collect solid waste material;

a channel leading from said housing into said sump for return of lubricant thereto;

a bore communicating at one end with said sump; a piston slidably mounted to reciprocate within said bore;

a shaft rotatably mounted to said case and passing through the bottom of said housing into said sump, said shaft being rotatably driven at one end thereof by said transmission, the other end of said shaft eccentrically communicating with said piston within said sump to impart reciprocating motion thereto;

lubricant flow means communicating said sump with the other end of said bore; and

valve means at the other end of said bore communicating with conduit means for directing lubricant from said sump to said transmission, said valve means opening responsive to pressure exerted thereon to allow lubricant to flow therethrough as said piston reciprocates toward said other end of said bore and closing to prevent lubricant from returning therethrough responsive to said piston reciprocating away from said other end of said bore.

3,907,071

FOOLPROOF CONTROL SYSTEM FOR TRAILER BRAKES WITH BREAK-AWAY SAFETY

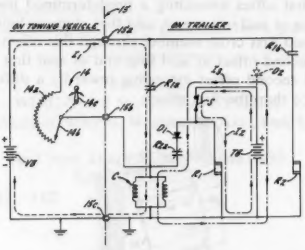
William Henry Sidney Wells, Great Wyrley, England, assignor to Wellcroft (Control Gear) Ltd., Great Haywood, England

Filed May 3, 1974, Ser. No. 466,560
Int. Cl.² B60T *7/20*
U.S. Cl. 188—3 R **11 Claims**

1. In a control system for a brake of a trailer which is adapted to be removably hitched to a towing vehicle, said brake being engaged when an associated coil is energized by current flow therethrough, said vehicle carrying a voltage source, and said trailer carrying an auxiliary battery, the combination comprising

a. a disengageable connector having separable parts joined by the user when the trailer is hitched to the vehicle and, when joined, applying the source voltage across terminals on the trailer,

b. first circuit means, including a conductive path via said terminals, for energizing said coil by current flow from the voltage source,



c. means responsive to the condition of said battery for disabling said first circuit means when said connector parts are joined if said battery is not defective, and

d. means for connecting said battery in series with said coil when the trailer breaks away from the vehicle,

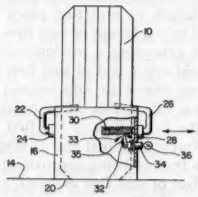
whereby the trailer brake is engaged under circumstances where said connector parts are joined and the battery is defective due to a discharged state or other reasons and the emergency break-away action of said means (d) would therefore be ineffective.

3,907,072

CHOCK-LOCK BLOCK

Kenneth A. Shafer, Hohokus, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 22, 1974, Ser. No. 499,510
Int. Cl.² B60T *3/00*
U.S. Cl. 188—32 **9 Claims**



1. A device for immobilizing a wheeled transport comprising a hollow wheel chock, a first arm means mounted on said chock for engaging said wheel, a second arm means mounted on said chock for engaging said wheel, and means within said chock for locking said second arm means into engaging position with said wheel; whereby said chock protects said locking means from tampering.

3,907,073

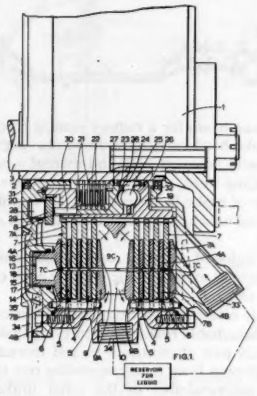
MULTI-PLATE DISC BRAKES FOR VEHICLES

Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Oct. 5, 1973, Ser. No. 403,984
Claims priority, application United Kingdom, Oct. 12, 1972, 47006/72
Int. Cl. F16d *55/02*
U.S. Cl. 188—71.2 **20 Claims**

1. A disc brake of the multi-plate type for vehicles comprising a housing, stationary and rotatable braking members located in said housing of which one of said braking members

comprises a first pump member, applying means for urging said braking members into engagement to apply the brake, and a second pump member located within said housing and defining with said first pump member pump means, each pump member provided with passage means defining a path for liquid flow through that member in a generally radial direction, at least when said brake is applied, said passage



means in said pump members being constructed and arranged so that when said pump members are rotating relatively to each other, liquid is circulated through said housing and over said braking members in a generally radial direction, said second pump member being floatingly mounted within said housing and rotatable with respect to both said stationary and rotatable braking members.

3,907,074

MECHANICALLY OPERATED DISC-BRAKES

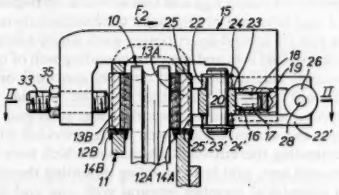
Michel Rist, Boulogne, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed July 30, 1973, Ser. No. 383,671

Claims priority, application France, Aug. 8, 1972, 72.28536; July 18, 1973, 73.26262

Int. Cl.[2] F16D *55/02*

U.S. Cl. 188—72.9 **31 Claims**



1. A parking type disc brake comprising a disc mounted for rotation with a member to be braked, a fixed support, a brake-shoe mounted relative to the fixed support on each side of said disc for movement perpendicular to the plane of said disc, a pair of operating levers having cam means in rolling contact with a first one of said brakeshoes for applying braking force thereon, a traction cable coupled to one of said operating levers, a sheath surrounding the cable and in abutment against the other of said operating levers, a transfer member mounted for movement with respect to said disc for transmitting braking force to the second brakeshoe, a core member pivotally mounting said pair of operating levers about a first axis, and means pivotally mounting said core member on said transfer member about a second axis which is transverse to said disc and to said first axis and to said cable, said operating levers being pivoted at points spaced along said first axis on opposite sides of said second axis, whereby in response to pivotal movement of said operating levers about said first axis, said core member pivots about said second axis thereby enabling rolling contact of said cam means on said first brakeshoe while applying the braking force thereto.

3,907,075

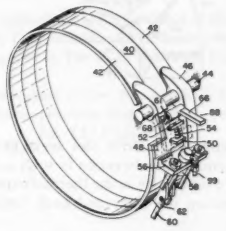
BRAKE MECHANISM FOR WINCH DRUMS

Sommerville G. Christison, Delta, and Michael P. Smyth, Surrey, both of Canada, assignors to Gearmatic Company, Ltd., Surrey, Canada

Filed Dec. 26, 1973, Ser. No. 427,987

Int. Cl.[2] F16D *49/06*

U.S. Cl. 188—77 W **13 Claims**



1. A brake mechanism for application of drag and full braking forces to a cylindrical rotating means, comprising:

a brake band substantially encircling said cylindrical rotating means and adapted to engage a portion of the outer surface thereof, said brake band having a first end immovably fixed relative to the cylindrical means, and intermediate portion and a second end movable relative to said first end,

A first brake actuator interconnected with the movable second end of said brake band, said first brake actuator including brake applying means for tightening the band by moving the movable second end in the direction of rotation of the cylindrical rotating means and brake releasing means,

a second brake actuator engageable with said brake band intermediate the ends of the brake band to apply releasable drag braking force to the brake band by moving the intermediate portion of the brake band in the same direction as said first brake actuator moves said movable end of the brake band when tightening the band after said brake releasing means of said first brake actuator has been activated, and

control means for said brake actuators to selectively apply brake releasing force to said brake actuators.

3,907,076

KEY SLOT SEGMENTS FOR DRIVING BRAKE DISCS

Richard L. Crossman; Albert W. Cook, both of Tallmadge, Ohio, and Jesse G. Hawley, Penn Yan, N.Y., assignors to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 146,181, May 24, 1971, Pat. No. 3,757,907. This application Sept. 10, 1973, Ser. No. 395,530

Int. Cl.[2] F16D *65/12*

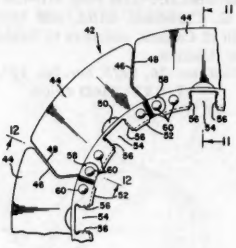
U.S. Cl. 188—218 XL **3 Claims**

1. A brake disk assembly comprising:

a disk body defining an articulated, segmented, substantially annular configuration and made from a carbon based material;

a plurality of curved notches formed in at least one peripheral edge of the body and equally spaced around substantially the full circumference thereof, each notch being intermediate the ends of a disk segment;

a separate unitary one-piece metal drive slot segment operatively substantially non-engagingly associated with each curved notch of the disk body, each drive slot segment defining a torque driving surface positioned within said associated notch for engaging drive splines of a brake assembly on which the disk is installed; all of said drive slot segments being of uniform shape;



means securing each drive slot segment to the body for torque transfer therebetween in such a relationship as to allow for a difference in the thermal expansion characteristics between the body and each respective drive slot segment;

each respective drive slot segment being offset at one end and overlapping the opposite end portion of the adjacent drive slot segment, and said means securing each drive slot segment to the body likewise securing the overlapped end portions of adjacent drive slot segments together.

3,907,077

DISC BRAKES

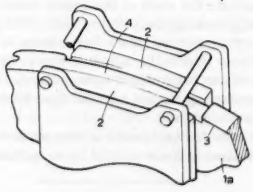
John Charles Ford, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Feb. 14, 1974, Ser. No. 442,338

Claims priority, application United Kingdom, Feb. 17, 1973, 7909/73

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 XL **2 Claims**



1. A disc for a disc brake in which at least one face of the disc is engaged by a friction pad of which the radially outer edge does not extend to the peripheral edge of the disc, wherein two diametrically opposed substantially equal portions of the periphery of the disc adjacent said at least one face are cut-away over circumferential lengths each only slightly greater than the circumferential length of said friction pad, the radial dimension of each cut-away portion being at least equal to the radial dimension of the outer part of the disc which is not swept by the pad, and the remainder of the braking surfaces of the disc extending to the full diameter of the disc.

3,907,078

BRAKE BEAM AND SECTIONALIZED BRAKE HEAD THEREFOR

Donald C. Means, Export, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 19, 1974, Ser. No. 443,766

Int. Cl.² B61H *13/36*

U.S. Cl. 188—222.1 **12 Claims**

1. A brake beam for a railway vehicle truck comprising:

a. a brake-head-carrying member having formed integral therewith adjacent each end thereof a pair of oppositely extending webs, wherein the improvement comprises:

b. a pair of brake-head-receiving rim members, one side of each of which is formed integral with one pair of said webs,

c. two pairs of separate detachable brake-shoe-carrying brake head members one pair for each of said rim members, and

d. readily releasable locking means for securing each separate detachable brake-shoe-carrying brake head member of each pair of members to and thereafter enabling its detachment from a corresponding one of said rim members independently of the other brake head member secured to said corresponding one rim member.

6. A brake beam for a railway vehicle truck wherein the improvement comprises:

a. a T-beam extending a substantial distance in opposite directions from a point midway the length of said brake beam,

b. a first pair of U-shaped channel members each integral at one end with one end of said T-beam and forming an obtuse angle therewith, each U-shaped channel member having a pair of legs and an integral web connecting one end of one leg with the corresponding and of the other leg, one end of said legs and said web being integral with the corresponding end of said T-beam, and said legs extending divergently therefrom,

c. a second pair of U-shaped channel members having a pair of parallel spaced-apart legs and an integral web connecting one end of one leg with the corresponding end of the other leg, one end of said legs and said web of each of said second pair of U-shaped channel members being respectively formed integral with the other end of said divergently extending legs and said web of a corresponding one of said first pair of U-shaped channel members, and

d. a pair of spaced-apart bosses each formed integral with each of said legs and the corresponding web of one of said second pair of U-shaped channel members on the side thereof adjacent the other leg and coaxial with the spaced-apart boss on the other leg, each pair of bosses and the corresponding web being provided with a bore extending therethrough, the axis of which bore is parallel to said legs, said bore enabling mounting therein such as a cylindrical member integral with one end of a clevis constituting a hand brake lever fulcrum means.

3,907,079

VISCOUS FLUID DAMPER

Arthur S. Chapman, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 31, 1973, Ser. No. 411,508

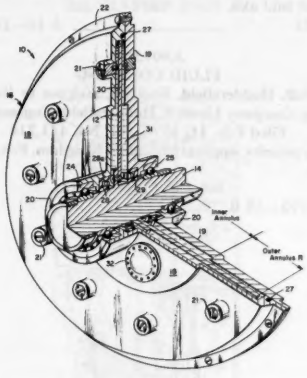
Int. Cl.² F16D *57/02*

U.S. Cl. 188—290 **14 Claims**

1. A fluid damper comprising:

damper surfaces arranged in opposing relationship and disposed to provide a gap for damping fluid wherein said gap comprises a plurality of different gap spacings be-

tween at least two opposing damper surfaces; said damping fluid comprising a fluid of high viscosity having a linearly increasing shear resistance at lower shear stresses and substantial limiting of shear resistance at higher shear stresses and filling said gap; and



means for supporting the opposing damper surfaces for relative movement to produce different rates of non-turbulent shear concurrently in the damping fluid disposed in the gap over the operating range of said damper including a higher rate of shear in the fluid in the smaller gap spacing for increasing the shear stresses in the smaller gap in order to provide the desired limiting of shear resistance characteristics for the damper.

3,907,080

TELESCOPIC SHOCK ABSORBER AND DUST SHIELD

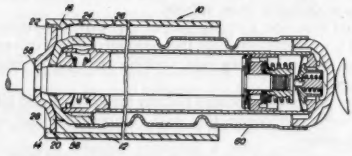
Stanley Vincent Chadwick, Wigan, England, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 224,049, Feb. 7, 1972, Pat. No. 3,844,314. This application Apr. 4, 1974, Ser. No. 458,006

Claims priority, application United Kingdom, Feb. 25, 1971, 5454/71

Int. Cl.² F16F 9/38

U.S. Cl. 188—322 **1 Claim**



1. A telescopic shock absorber comprising an inner cylindrical casing having a central longitudinally extending axis, an outer cylindrical casing concentric with and radially spaced from said inner casing, a piston mounted for reciprocating axial movement in said inner cylindrical casing, a reciprocally movable piston rod operatively connected to said piston and extending axially out of said cylindrical casings, a disk-like flange member rigidly secured to a portion of said piston rod extending outwardly of said cylindrical casings, said flange member having an outer peripheral edge portion of predetermined thickness, a dust shield for said shock absorber, said dust shield consisting of a hollow and continuous cylindrical body of flexible plastic material extending around a portion of said rod and a portion of said outer cylindrical casing, said dust shield having a first ring of separate arcuately spaced and inwardly projecting castellations integral with said cylindrical body adjacent to one end thereof, said dust shield further having a second ring of separate arcuately spaced and inwardly projecting castellations integral with said cylindrical body axially spaced a predetermined distance from the first ring of castellations, said first and second rings of castellations providing a seat therebetween to receive said annular peripheral edge portion of said flange member, said castellations of said first and second rings respectively having contact surfaces which face one another for respectively engaging and gripping the upper and lower sides of said peripheral edge portion of said flange member when said flange member is positioned in said seat, said castellations of said second ring being formed with a ramp so that said dust shield can be deflected by said flange member when said flange portion is axially inserted into said dust tube to permit said peripheral portion of said flange member to be subsequently trapped between said first and second rings of castellations.

3,907,081

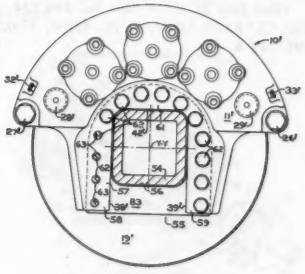
MOUNTING ARRANGEMENT FOR A CALIPER BRAKE

Philip A. Smith, Troy, and Ronald H. Setser, West Milton, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 412,888, Nov. 5, 1973, abandoned. This application May 3, 1974, Ser. No. 466,727

Int. Cl.² F16D 65/02

U.S. Cl. 188—73.3 **4 Claims**



1. A caliper brake having a brake head assembly secured to a torque flanged by threaded fasteners screwed in spaced-apart holes in said torque flange with said torque flange being fixedly mounted on an axle comprising a mounting flange on said brake head assembly having a U-shape with an end portion and two legs for positioning over said axle and contiguous with said torque flange, said mounting flange having a plurality of openings in each of said legs disposed at spaced-apart positions along said legs and in said end portion in matching relationship with said holes in said torque flange for receiving said threaded fasteners whereby said brake head assembly can be installed and removed by insertion or removal of said threaded fasteners and movement of said legs of said mounting flange into and out of straddling relationship with said axle, said axle having an axis and said openings in said legs of said mounting flange which are located at a greater distance from said end portion being spaced at a greater distance from said axis to increase the force transmitted by said legs to said torque plate.

3,907,082

CLUTCH AND BRAKE FOR A WASHING MACHINE

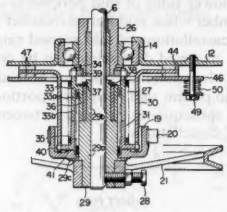
Tamotu Shikamori, and Eiichi Hasegawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 15, 1974, Ser. No. 433,436

Claims priority, application Japan, Jan. 16, 1973, 48-6629

Int. Cl.[2] F16D *67/02*

U.S. Cl. 192—12 BA **3 Claims**



3. A drive device according to claim **1**, wherein said dehydration tank shaft is adapted to be connected to said clutch boss of the double cylinder type by means of a claw coupling, and said clutch boss of the double cylinder type is supported by a hollow shaft portion formed integrally with said clutch boss of said clutch shaft.

3,907,083

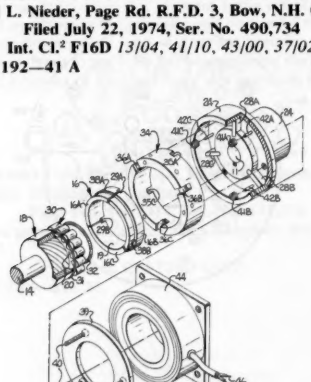
CONTROLLABLE BI-DIRECTIONAL COUPLING DEVICE

Berthold L. Nieder, Page Rd. R.F.D. 3, Bow, N.H. 03103

Filed July 22, 1974, Ser. No. 490,734

Int. Cl.[2] F16D *13/04, 41/10, 43/00, 37/02*

U.S. Cl. 192—41 A **11 Claims**



1. A controllable bi-directional coupling device comprising:

a first member mounted for rotation about a predetermined axis and having a first coupling surface,

a second member mounted in spaced relation to said first member and having a second coupling surface spaced from said first coupling surface,

one of said first and second members being constructed for variation in the effective dimensions of the corresponding one of said first and second coupling surfaces,

a plurality of coupling members for controlled frictional engagement with said first and second coupling surfaces, means for mounting said coupling members in position for simultaneous engagement with both of said first and second coupling surfaces, and

controllable means for varying the effective dimensions of said one of said first and second members and thereby for controlling frictional engagement of said first and second surfaces with said coupling members,

certain of said coupling members frictionally coupling said first and second members upon relative movement therebetween in one direction of rotation about said axis and the remainder of said coupling members frictionally coupling said first and second members upon relative movement therebetween in the opposite direction of rotation about said axis.

3,907,084

FLUID COUPLING

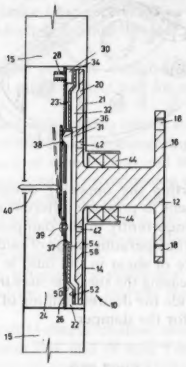
Jeffrey Hall, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England

Filed Feb. 11, 1974, Ser. No. 441,214

Claims priority, application United Kingdom, Feb. 14, 1973, 7168/73

Int. Cl.[2] F16D *35/00*

U.S. Cl. 192—58 B **11 Claims**



1. A fluid coupling containing a working fluid and comprising:

a rotatable driving member;

a rotatable driven member;

a working chamber forming part of said rotatable driven member;

means mounting at least part of said rotatable driving member for coaxial rotation within said working chamber;

said driving member and working chamber having opposing faces defining shear spaces;

a fluid reservoir forming part of said driven member;

inlet port means adjacent the periphery of said driven member and connecting said working chamber to said reservoir;

outlet port means located radially inwardly of said inlet port means and connecting said reservoir to said working chamber;

flow accelerating passage means within said part of said driving member located within said working chamber,

fluid transfer duct means extending axially between said outlet port means and said flow accelerating passage means;

said fluid flow accelerating passage means being open at each end and extending from a location immediately radially outwardly of said fluid transfer duct means to the periphery of that part of said driving member disposed within said working chamber;

the periphery of said part of said driving member being at a greater radial distance from the co-axial centers of the driving and driven members than said inlet port means; and

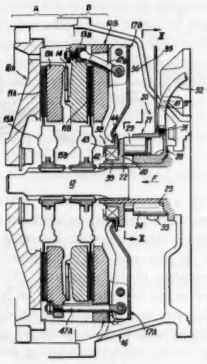
valve means operable to selectively open and close said outlet port means and control the return flow of fluid from said reservoir to said shear spaces via said transfer duct means and fluid flow accelerating passage means.

3,907,085

CLUTCH WITH REMOVABLE HYDRAULIC OPERATOR

Michel Rist, Boulogne, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Jan. 22, 1974, Ser. No. 435,580
Claims priority, application France, Feb. 2, 1973, 73.03678
Int. Cl.² F16D 25/08
U.S. Cl. 192—91 A 15 Claims



1. In a clutch comprising at least one clutch assembly which includes a reaction plate adapted to be rotationally fastened on a first shaft, a friction disc movable axially in relation to the reaction plate and adapted to be rotationally fastened on a second shaft, a pressure plate movable axially in relation to the reaction plate and rotationally fastened thereto, elastic means urging the pressure plate toward the reaction plate in order to clamp the friction disc, at least one pivoting clutch release lever to unclamp the friction disc, and fluid-operated means adapted to operate and pivot said release lever; the improvement comprising a sleeve coaxial with said shafts, said fluid operating means being a removable unit with stirrup-shaped casing means that is received and retained on said sleeve by mere displacement transversely with respect to the sleeve to bring the casing means into engagement with the sleeve, the stirrup-shaped casing means having two arms, each of said arms being formed with a cylinder receiving an axially movable piston, the cylinders being disposed symmetrically to each side of an axial plane of symmetry passing through said casing means, the axes of displacement of said pistons defining a plane perpendicular to said axial plane of symmetry, the axis of the sleeve being located between the last-mentioned plane and the bite zone of the stirrup-shaped casing means joining the arms thereof, the bite portion of the stirrup-shaped casing means having a cylinder receiving a third axially movable piston whose axis of displacement is in said axial plane of symmetry.

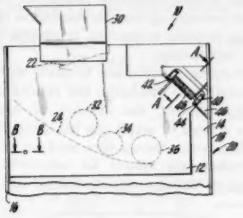
3,907,086

APPARATUS FOR RETARDING THE CLOSING OF THE HINGED COVER OF A COIN MECHANISM

Frederick Gordon Willis, Winchester, Mass., assignor to Mars, Incorporated, McLean, Va.

Filed May 8, 1974, Ser. No. 468,508
Claims priority, application United Kingdom, May 18, 1973, 23882/73
Int. Cl.² G07F 100/00
U.S. Cl. 194—1 K 9 Claims

1. A coin handling apparatus comprising first and second spaced plates, the inner surfaces of which form walls of a passageway for coins, the two plates being joined by a hinge proximate an edge of the first plate permitting rotation of the first plate away from the second plate, the hinge axis being parallel to the inner surface of the first plate and displaced from it in the direction away from the second plate, a spring to bias the first plate toward the second plate, a stop on one plate which abuts an abutment surface on the other plate when the plates are closed to space the plates and position



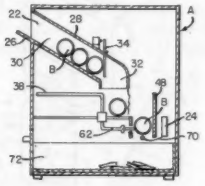
them substantially parallel to one another closed and a resilient snubber block spaced from the first plate when the plates are closed having a deflectable surface which is engaged by the said edge of the inner surface as the first plate is rotated about its axis towards the second plate to apply a moment to the first plate in the opposite direction.

3,907,087

DEVICE FOR DISCHARGING REFUND COINS AND CRUSHING METALLIC CANS OF DIFFERENT SIZES

Hosaku Tanaka, 696 Nagahama, Kochi-ci, Kochi, Japan

Filed Aug. 12, 1974, Ser. No. 496,796
Int. Cl.² G07F 7/06
U.S. Cl. 194—4 C 1 Claim



1. An automatic device for simultaneously crushing an individual empty metallic can of either a large or small size and discharging a refund coin of a certain monetary value therefrom, therein comprising:

a vertically-oriented housing;

a longitudinal hopper means having entry and terminal ends, said entry end being formed as an access opening on said housing through which the selected size metallic can may be deposited, said hopper means being mounted inclined to the vertically-oriented housing and forming a passageway through said housing whereby the deposited metallic can may be rolled and guided therealong to said terminal end;

first microswitch means within said housing for controlling the release of an individual can from said terminal end;

a pusher means located at said terminal end;

a crusher box means located adjacent said pusher means and having a wall means;

movably mounted pressure plate means located in said crusher box means;

motor means drively associated with said pressure plate means for reciprocating said pressure plate means within said crusher box means;

said pusher means adapted to transfer the metallic can from said terminal end to a crushable position in front of said pressure plate means within said crusher box means;

said motor-driven pressure plate means operatively crushing the transferred metallic can on the forward stroke of said reciprocation within said crusher box means;

second and third microswitch means located a short distance from each other and both mounted on said wall means of said crusher box means for selectively limiting the distance of the forward stroke of said reciprocation to first and second terminal positions, respectively, said positions permitting the accomodation of large and small size cans in their respective crushable positions in said crusher box means;

coin discharging mechanism located within said housing and operative to discharge the refund coin of a certain monetary amount, the amount of which depends on whether a large or small can has been deposited; and

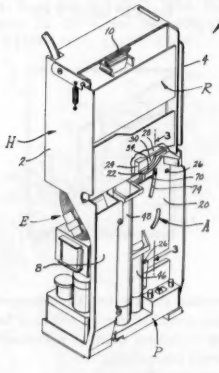
fourth microswitch means mounted on said wall means of said crusher box means for selectively activating the discharge of the appropriate refund coin.

3,907,088

APPARATUS FOR SENSING THE PASSAGE OF COINS THROUGH AND THE RETENTION OF COINS IN A COIN HANDLING MECHANISM

Norman J. Burzen, Pacific, Mo., assignor to Nordon Industries, Inc., Fenton, Mo.

Filed May 6, 1974, Ser. No. 466,990
Int. Cl.[2] G07F *5/10*
U.S. Cl. 194—9 R **14 Claims**



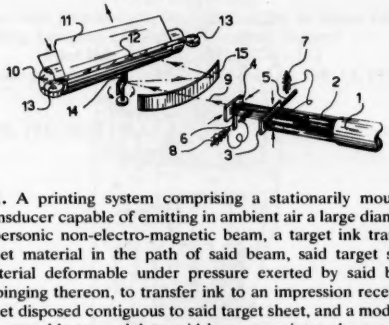
1. In a machine for accepting coins and having a housing provided with a generally upright wall, a switch on one side of the wall, and chute means on the other side of the wall and defining a coin channel through which coins pass, the improvement comprising: a control element at said other side of the wall and being mounted for pivoting motion about an axis fixed in position with respect to the chute means, the control element being projected across the coin channel in the chute means such that when a coin passes through the channel it will pivot the control element; and an operating element at said one side of the wall and pivoting about an axis substantially coincident with the axis about which the control element pivots, the operating element being connected to the switch, the operating element further being projected through the wall and being releasably connected to the control element at said other side of the wall such that when the control element pivots, the operating element moves and operates the switch, whereby when a coin passes through the coin channel the switch operates.

3,907,089

SUPERSONIC PRINTING METHOD AND SYSTEM THEREOF

Marcel Montoya, 2180 Souvenir St., Apt. 7, Montreal, Quebec, Canada (H3A 1S1)

Filed July 10, 1973, Ser. No. 377,902
Int. Cl.[2] B41J *3/20*
U.S. Cl. 197—1 R **2 Claims**



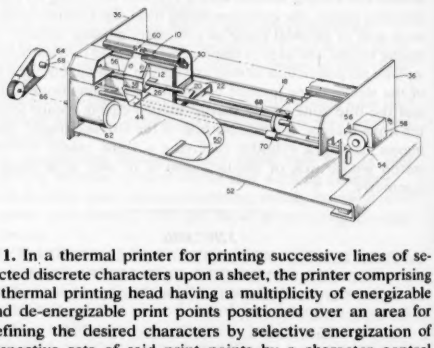
1. A printing system comprising a stationarily mounted transducer capable of emitting in ambient air a large diameter supersonic non-electro-magnetic beam, a target ink transfer sheet material in the path of said beam, said target sheet material deformable under pressure exerted by said beam impinging thereon, to transfer ink to an impression receiving sheet disposed contiguous to said target sheet, and a modulating assembly to modulate said beam to print a character on said recording sheet, said modulating assembly including a pair of superposed masking plates, each having a narrow slit, the slits perpendicular to each other and in the path of said beam to allow the emergence of only a small diameter beam through the intersection of said slits, and interdependently controlled electromechanical means to move each plate back and forth to cause said small diameter beam to sweep said target sheet along a trace forming the character desired to be printed on the impression receiving sheet.

3,907,090

PRINTER AND PRESSURE ASSEMBLY THEREFOR

William E. Northfield, Arlington, and Joel S. Novak, Hudson, both of Mass., assignors to Computer Devices, Inc., Burlington, Mass.

Filed Feb. 19, 1974, Ser. No. 443,419
Int. Cl.[2] B41J *3/05*
U.S. Cl. 197—1 R **17 Claims**



1. In a thermal printer for printing successive lines of selected discrete characters upon a sheet, the printer comprising a thermal printing head having a multiplicity of energizable and de-energizable print points positioned over an area for defining the desired characters by selective energization of respective sets of said print points by a character control circuit, a carriage means for advancing said head stepwise across said sheet to a plurality of discrete character positions and for returning said head, a sheet transport mechanism for advancing said sheet lengthwise after the printing of each line, and a pressure applying system for causing said thermal printing head to thermally contact said sheet, the improvement wherein said pressure applying system is an electromagnetic

system comprising a first flux carrying member attached to and secured to move with said head and carriage, said flux carrying member having at least a pair of spaced apart faces, and a second flux carrying member which is elongated, extends parallel to the path of advance of said head and presents a pair of elongated faces opposed and parallel to respective faces of the first said flux carrying member, at least one of said flux carrying members associated with electromagnet coil means, and said first and second flux carrying members together defining a magnetic circuit for flux produced by said coil means regardless of the position of advance of said head, and control circuitry for energizing said coil means while said printing head is stopped in a said discrete character position, said first flux carrying member being arranged to press said printing head to thermally contact said sheet in response to flux produced by energization of said coil means, whereby a selected set of said print points on said print head, energized by said character control circuit, are caused simultaneously to firmly press against said sheet in the absence of relative lateral movement to produce a character on said sheet.

3,907,091

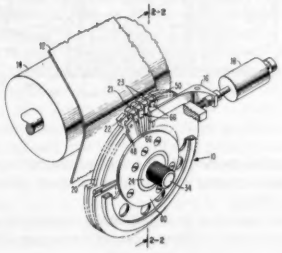
TYPE DISC-INTERPOSER ASSEMBLY FOR A PRINTER

Johann Hans Meier, Vestal, and Jerry Wesley Raider, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 259,320, June 2, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 415,277

Int. Cl.[2] B41J *1/32*

U.S. Cl. 197—53 **25 Claims**



1. Printing apparatus for use in a printer having a rotatable print carrier support which is movable across a document and having a print hammer operable from a rest position to effect impact of a type carrying element on said support which is intermediate said document and said print hammer against said document for printing thereon comprising;

a rotatable print disc having a plurality of resilient axially-movable type carrying elements with two faces, said type carrying elements having type characters on one face adjacent said document,

an interposer disc disposed to rotate with said print disc and having the same plurality of resilient radial spokes positioned adjacent and normally in contact with the other face of the type carrying elements, said radial spokes being stiffer than said type carrying elements and having cam surfaces for engagement with said print hammer which are operable to restore said print hammer to said rest position by cam action as they rotate past said print hammer, and

means securing the print disc and interposer disc on said rotatable support in predetermined fixed rotational relation to each other so that said print disc and interposer disc rotate together at the same angular velocity and said interposer spokes impart an axial velocity to said print disc type carrying elements when impacted by said print hammer, causing said print disc type carrying elements to separate from said interposer spokes before impacting said document to print.

3,907,092

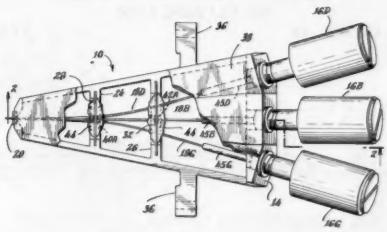
MATRIX WIRE PRINT HEAD WITH FREE BENDING PRINT WIRES

Okun Kwan, Trumbull, and James Vincent Masi, Huntington, both of Conn., assignors to The Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 12, 1973, Ser. No. 378,774

Int. Cl. B41J *3/04*

U.S. Cl. 197—1 R **8 Claims**



1. A wire matrix print head employing a plurality of print wires on which friction is reduced, although all or all but one of said print wires are bent between the printing and non-printing ends thereof, the use of guide tubes therebetween being eliminated, comprising

a plurality of n print wires each having a printing and a non-printing end thereon, said n print wires each having a positionally determined natural deflection with peak vibrating deflection points when vibrating at its natural frequency of vibration and a critical length L for a straight unsupported section thereof defined by

$$L = 2\pi\sqrt{\frac{EI}{P}}$$

where

P = critical buckling load

E = Young's Modulus of Elasticity

I = moment of inertia,

b. means for mounting the non-printing ends of said print wires with one wire in the middle and the other $(n-1)$ wires substantially symmetrically positioned around said one wire with the angular spacing between adjacent wires being substantially equal,

c. a print guide member having n openings therein with a predetermined spacing between adjacent openings for supporting one of said print wires on said print end thereof which passes through each of said openings,

d. first and second guide plates,

e. means for mounting said first and second guide plates at predetermined positions between said means for mounting the non-printing ends of said wires and said print guide member, said predetermined positions being such that said first guide plate is spaced from said print guide member by a first predetermined distance, said first and second guide plates being spaced from each other by a second predetermined distance, and said second guide plate being spaced from said means for supporting the non-printing ends of the wires by a third predetermined distance, said first, second and third predetermined distances all being shorter than said critical length for each of said unsupported sections of said print wires to prevent the buckling of said sections of said print wires,

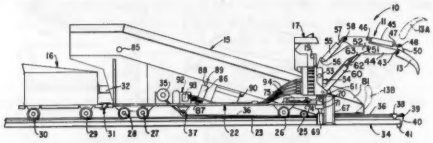
f. said first and second guide plates each having a center opening through which said one wire passes, and (-1)

other openings positioned around the center opening through a separate one of which each of the other $(n-1)$ wires passes, the spacing of each of said openings from the corresponding center opening being a function of said natural deflection of the print wire passing therethrough at the predetermined positions of said first and second guide plates.

3,907,093
TUNNELING MACHINE

Phillip M. Skibo, Yonkers, N.Y., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Dec. 17, 1973, Ser. No. 425,212
Int. Cl.[2] B65G *65/06*
U.S. Cl. 198—10 **3 Claims**



1. In a material handling machine:

a. a frame,

b. means on said frame for supporting the latter for movement on a supporting element,

c. inclined conveyor means on said frame for carrying material from a forward lower receiving end thereof to a rearward elevated delivery end thereof,

d. means supported from the forward end portion of said frame for digging into material directly ahead and to opposite sides of said frame and conveyor means and for carrying the material rearwardly to said forward receiving end of said conveyor means,

e. a pair of wings mounted on opposite sides of said frame for clearing debris along the side of the machine and providing stabilization therefor,

f. means for pivoting said wings about vertical axes to extend the wings from a retracted position to an operative position,

g. and means for controllably moving said wings vertically to selectively position the lower wing edges.

3,907,094
RIBBON FEEDING AND REVERSING MECHANISM

Herbert Decker, Lauf, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed May 10, 1973, Ser. No. 359,130
Claims priority, application Germany, May 16, 1972, 2223757
Int. Cl. B41j *33/46*
U.S. Cl. 197—162 **1 Claim**

1. In a ribbon feeding arrangement, the combination comprising:

first and second ratchet wheels supported for rotational movement for alternatively driving a pair of ribbon spools to wind a ribbon thereon,

first and second indexing pawls for rotatably indexing said first and second ratchet wheels in opposite rotational directions,

an oscillatable drive member for imparting a common oscillatable movement to said first and second indexing pawls for rotatably indexing said first and second ratchet wheels,

said first and second indexing pawls being movably supported on said oscillatable drive member for movement from indexing engagement with said first and second ratchet wheels respectively,

resilient biasing means for urging said first and second indexing pawls toward indexing engagement with said first and second ratchet wheels,

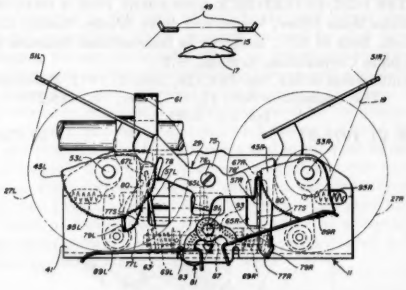
a control member having first and second arms for engagement with said first and second indexing pawls and being supported for movement to first and second alternate positions,

said first arm guiding said first indexing pawl from engagement with said first ratchet wheel upon movement of said control member to said second alternate position to enable rotational indexing of said second ratchet wheel by said second indexing pawl, and

said second arm guiding said second indexing pawl from engagement with said second ratchet wheel upon movement of said control member to said first alternate position to enable rotational indexing of said first ratchet wheel by said first indexing pawl,

a first lock pawl carried by said first arm for engagement with said first ratchet wheel upon movement of said control member to the first alternate position for preventing reverse rotational movement of said first ratchet wheel, and

a second lock pawl carried by said second arm for engagement with said second ratchet wheel upon movement of



said control member to the second alternate position for preventing reverse rotational movement of said second ratchet wheel,

said control member being pivotally supported and having first and second shifting surfaces for engagement by said first and second indexing pawls,

a first tension member associated with said first ratchet wheel for sensing the tension of a ribbon being wound on a spool driven by said second ratchet wheel and being operable in response to increased ribbon tension for moving said first indexing pawl against the urging of said resilient biasing means for acting against the first shifting surface to effect movement of said control member to the first alternate position, and

a second tension member associated with said second ratchet wheel for sensing the tension of a ribbon being wound on a spool driven by said first ratchet wheel and being operated in response to increased ribbon tension for moving said second indexing pawl against the urging of said resilient biasing means for acting against the second shifting surface to effect movement of said control member to the second alternate position.

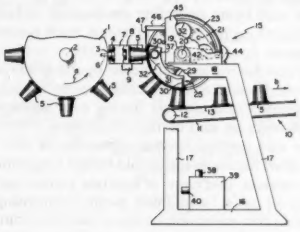
3,907,095
ARTICLE TRANSFER APPARATUS

Edward J. Russell, Gladwin, Mich., and Robert W. Tielrooy, Holland, Netherlands, assignors to Van Dam Machine Corporation of America, West Paterson, N.J.

Filed Sept. 19, 1973, Ser. No. 398,672
Int. Cl.[2] B65G *47/91*
U.S. Cl. 198—25 **1 Claim**

1. Apparatus for transferring flat bottomed cup-shaped articles from a first article conveying means to a second article

conveying means; said apparatus comprising an endless perforate conveying member mounted for movement along a circular path having a horizontal axis with a first section of of said path extending through an arc of approximately 90° with one end of said first section being horizontally aligned with said axis and disposed in spaced horizontally opposed relationship to an article discharge station on said first conveying means and the opposite end of said first section being spaced downwardly from said one end and disposed in spaced opposed vertically overlying relationship to an article receiving station on said second conveying means, drive means for driving said endless conveying member along said path from said one end of said first section downwardly along said first section toward said opposite end, pneumatic means on said first article conveying means at said discharge station for blowing an article



bottom end first from said first conveying means into contact with said endless conveying member at said one end of said first section of said path, a deflector finger projecting downwardly in tangential relationship to said endless path at said one end of said first section and having a lower end terminating slightly above a horizontal plane containing said axis to engage the uppermost portion of the bottom of an article as said article first contacts said endless conveying member, suction means underlying said endless perforate conveying member along said first section of said path operable to retain an article on said endless conveying member during movement therewith from said one end of said first section to said opposite end and to release said article upon arrival at said opposite end of said first section to permit said article to drop bottom up onto said second conveying means at said receiving station.

3,907,096

VIALS FEED DEVICE ALONG AN INCLINED PLANE FOR VIALS HANDLING MACHINES

Elisabetta Cioni; Lucia Cioni, and Rovena Anichini Cioni, widow, all of Via di Marciano 22, Siena, Italy

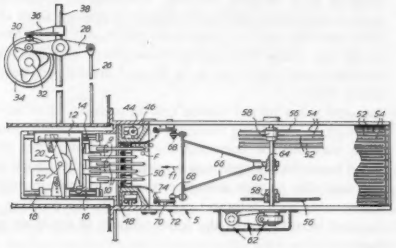
Filed Jan. 24, 1974, Ser. No. 436,390

Claims priority, application Italy, Jan. 29, 1973, 9317/73

Int. Cl.² B65G *47/28*

U.S. Cl. 198—30 **1 Claim**

1. A device for supplying vials and the like to a vial handling machine, having a conveying means for receiving the vials and the like and conveying the same to the machine, by sliding a mass of vials and the like in a feeding direction along a support surface toward the conveying means and, in advance of the conveying means, separating the advancing mass of vials and the like into regular rows for transfer thereof to the conveying means, said device comprising, in combination, inclined grid means forming said support surface and including a first fixed grid of laterally spaced first rods elongated in said feeding direction and a second grid of laterally spaced second rods elongated in said feeding direction and interposed between said first rods; separating means at the lower end of said inclined grid means and interposed between said inclined grid means and said conveying means; said separating means including rack members facing toward said inclined grid means and means operable to cyclically reciprocate said rack members to penetrate into the mass of vials advancing along said inclined grid means to separate the mass of vials into regular rows for subsequent transfer to said conveying means; and control means operatively associated with said second grid and operable to effect a cyclical motion of said second grid having a substantially linear trajectory, in said feeding direction, in a first zone of said second grid adjacent said rack members, and having an annular trajectory, in a vertical plane, in a second zone of said second grid spaced substantially from said rack members to obtain a cyclical lifting of the vials and the like from said first rods of said first fixed grid and a cyclical movement of the vials and the like toward said rack members; said control means including, in said second zone, eccentric



means operable to impart, to said second grid in said second zone, a substantially circular trajectory having an upper arc extending toward said rack members and a lower arc extending away from said rack members; said control means including, in said first zone, an oscillatory member and elastic blade members connecting said oscillatory member to said second grid in said first zone; said control means further including connecting rod means operable by said eccentric means and connected to said oscillatory member; said eccentric means operating said connecting rod means to advance said second grid toward said rack members in said first zone while said second grid, in said second zone, is operated by said eccentric means to travel along the upper arc of said substantially circular trajectory.

3,907,097

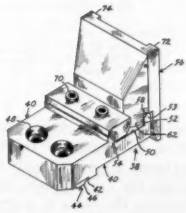
PUSHER LUGS FOR CONVEYORS

Harold R. Ziegelmeyer, 314 Howard St., Medford, Oreg. 97501

Filed Mar. 7, 1972, Ser. No. 232,553

Int. Cl.² B56G *19/00*

U.S. Cl. 198—173 **8 Claims**



1. A pusher lug adapted for firm and precise effective mounting on a conveyor component, comprising, in combination,

a. a base member constructed and arranged through the provision of vertically extending, screw receiving passages for direct, fixed attachment to the top of a conveyor component, and formed with an upwardly facing, longitu-

dinally extending channel which has a flaring, sharply sloping flat side,

b. a pusher member mounted on the base member and interlocked therewith, but with freedom for sliding movement lengthwise of the base member, said pusher member having a depending, wedge-shaped rib portion lodged in said channel but occupying only a portion of the width thereof and itself having a sharply sloping side of opposite inclination to the flaring channel side of the base member, which side is opposed to, and substantially spaced from said sloping side of the base member channel, so that the two opposed sloping side converge from top to bottom,

c. a wedging member extending along the channel and formed with sharply sloping, downwardly convergent, sides complementary to the opposed sloping sides of the base member and the pusher member, and broad enough to fill the space between said members and forcibly to broaden said space as it is forced downward between them, and

d. headed screw means whose shanks pass freely downward through the wedging member and are threaded into the base member for jamming the wedging member downward between the opposed sloping walls of the base member and the pusher member to fix the pusher member immovably in a selected position with the pushing face located in advance of the forward face of the base member,

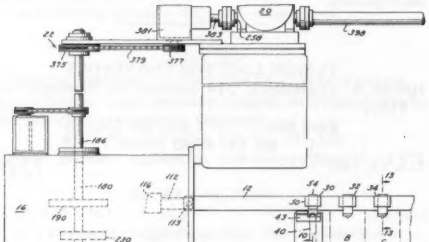
the construction and arrangement being such that the pusher member can be freed for infinitely variable, fore and aft adjustment, within limits, by backing off the screw means, but can be powerfully wedged and clamped in the chosen position through the mechanical advantage afforded by the screw means, reinforced and multiplied by the wedging apart effect of the wedging member.

3,907,098

BEAM TRANSFER MECHANISM

Albert B. Babbitt, Pontiac, Mich., assignor to Premier Engineering Company, Inc., Madison Heights, Mich.

Filed July 13, 1973, Ser. No. 378,830
Int. Cl. B65g *25/04*
U.S. Cl. 198—218 **10 Claims**



1. In a beam transfer mechanism for moving workpieces which comprises an elongated beam, workpiece-engaging fixtures on said beam, a carrier axially slidably supporting said beam, and means for moving said carrier laterally and for raising and lowering the same to correspondingly move said beam, the improvement comprising support means supporting said carrier for universal movement while maintaining its axis parallel in all positions throughout such movement, said support means comprising a first frame pivoted to said carrier on a first axis laterally spaced from and parallel to the axis of said carrier, a second frame pivoted to said first frame on a second axis laterally spaced from and parallel to said first axis, and means pivotally mounting said second frame on a third axis laterally spaced from and parallel to said second axis.

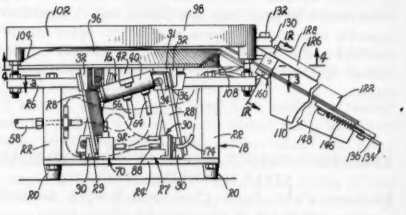
2. Transfer mechanism for moving workpieces step by step along a row of stations, comprising a pair of laterally spaced beams extending parallel to said row of stations, workpiece holding fixtures on each beam spaced apart distances corresponding to the distance between stations, the fixtures on one beam being respectively opposed to those on the other beam so that each pair of opposing fixtures is cooperable to grip a workpiece, a carrier supporting each end of each beam for longitudinal sliding movement, beam operating mechanism for moving said beams laterally toward and away from each other to cause the opposing fixtures to grip and release the workpieces, for raising and lowering said beams after they have been moved laterally toward each other to raise workpieces gripped by opposing fixtures from said stations and lower the same to said stations, and for moving said beams longitudinally after they have been raised to advance each workpiece gripped by opposing fixtures to the next station in the row, said beam operating mechanism including a control unit adjacent each end of said beams, each control unit having first means operable to laterally move said carriers, each control unit having second means operable to raise and lower said carriers, said first and second means comprising rotatable cams beneath said carriers having cam surfaces engageable with followers on said carriers to provide a free-floating support for said carriers by said cams, one of said control units having third means to move said beams longitudinally relative to said carriers, said cams of said one control unit being laterally spaced apart, said third means comprising linkage between said first-mentioned cams of said one control unit operably connected to said beams, and another cam between said first-mentioned cams of said one control unit having a cam surface engageable with a follower on said linkage.

3,907,099

FEEDER FOR HEADED OBJECTS

Arthur J. Smith, P.O. Box 3898, Visalia, Calif. 93277

Filed Mar. 13, 1974, Ser. No. 450,656
Int. Cl.[2] B65G *27/00*
U.S. Cl. 198—220 BC **26 Claims**



1. A feeder adapted to serially deliver a plurality of headed objects, comprising:

A. a base;

B. means including a vertically oriented open bowl supported for motion relative to said base and adapted to receive in confining relation an unordered mass of similarly configured headed objects, each having a head and an elongated shank projected axially from the head;

C. a discharge chute supported in juxtaposition with said bowl and disposed in a vertically oriented plane extended radially with respect to said bowl, including a pair of inclined rails arranged in mutual parallelism and defining within said plane an inclined channel adapted to receive the shanks of a plurality of headed objects supported by the heads thereof for gravitational motion along said pair of inclined rails;

D. delivery means including an object delivery way having an object supporting surface of an arcuate configuration circumscribing a portion of the top of said bowl for seri-

ally delivering a plurality of objects from said bowl into coplanar relation with said channel;

E. transfer means for transferring headed objects from said delivery way to said discharge chute including means for simultaneously elevating and translating the head of each object; and

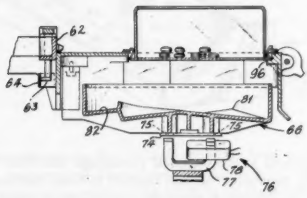
F. means for imparting vibratory motion to said bowl relative to said base.

3,907,100

PELLET FEEDING DEVICE

Alan B. Ranford, Desperes, and Joel A. Joslin, Crestwood, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Apr. 3, 1974, Ser. No. 457,677
Int. Cl.² B65G *27/00*
U.S. Cl. 198—220 BC **12 Claims**



1. A medicament pellet dispensing system comprising a plurality of medicament dispensing units arranged in close side-by-side array, a movable member for moving said array to bring a selected one of said units to a pellet dispensing station, each of said units comprising a frame connected to said movable member, a bowl having a bottom wall in generally horizontal orientation and a peripheral upstanding wall connected with said bottom wall having a generally elliptical configuration with longitudinally extending opposed outer sides and relatively shorter front and back opposed ends, a pellet feed outlet at said front end, said bottom wall having a central pellet storage portion, and a ramp at least partially surrounding said storage portion, said ramp continuously rising and connecting with said storage portion and extending around the back end of said bowl and connecting with said outlet, magnetic means substantially at the center of gravity of said bowl, a plurality of resilient spring members angularly spaced from each other, each of said spring members having one end connected to said frame and the opposite end to said bowl, each of said spring members being inclined to the vertical so that said bowl tends to move downwardly away from said frame and to rotate in one direction in opposition to the resilient forces of said spring members in response to a magnetic force acting on said magnetic means to produce a downward pulling force thereon, the resilient forces of said spring members, upon a reduction of said magnetic force, effecting a return upward and rotary movement of said bowl in the opposite direction of rotation to propel pellets in said bowl generally in said opposite direction of rotation along said ramp toward said outlet, and means at said dispensing station for intermittently producing said magnetic forces to thereby effect movement of pellets along said ramp and through said outlet.

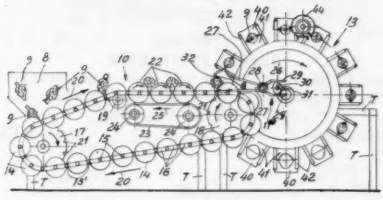
3,907,101

ARTICHOKE TREATING MACHINE

Giordano Tomelleri, 22 Via Montorio, Verona, Italy

Filed Jan. 18, 1974, Ser. No. 434,653
Claims priority, application Italy, Jan. 22, 1973, 84905/73
Int. Cl. B65g *47/24*
U.S. Cl. 198—266 **6 Claims**

1. An artichoke treating machine including a hopper supplying artichokes to a feeding device, and a former following said feeding device, said former comprising first automatic means taking artichokes from said feeding device and second automatic means adapted to position said artichokes within said former, said feeding device comprising a conveyor belt having rollers each shaped like a grooved pulley and with an annular channel in the centre of said groove, means for driving said belt with an intermittent forward motion including at least one chain deriving its motion from at least one gearwheel meshing with the links of said chain, means for rotating said rollers during the passage along a horizontal portion of the



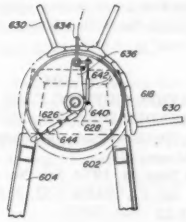
path of said conveyor belt during said intermittent advancing periods of said belt, said former including an artichoke gripping device including pincers with gripping jaws, a cam and an opposing spring actuating the arms of said jaws; means aligning the free ends of said jaws coaxially with positioning device; and a positioning device including two cups supported by arms sliding in sleeves, and lever mechanisms actuating said arms for taking an artichoke from the jaws of said pincers and transferring to further jaws gripping said artichoke on said former.

3,907,102

APPARATUS AND PROCESS FOR FORMING TUBULAR BODIES

Bernard J. Small, 8343 S. Winchester Ave., Chicago, Ill. 60620

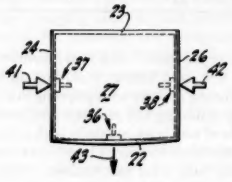
Continuation of Ser. No. 401,859, Sept. 28, 1973, abandoned, which is a division of Ser. No. 195,162, Nov. 3, 1971, Pat. No. 3,772,752, which is a division of Ser. No. 848,512, Aug. 8, 1969, Pat. No. 3,646,657. This application Sept. 4, 1974, Ser. No. 503,120
Int. Cl.² B65G *47/24*
U.S. Cl. 198—285 **2 Claims**



1. In an automatic system for fabricating automotive mufflers an apparatus for transporting a partially completed muffler along an elongated path between adjacent stages of said system comprising an endless conveyor, means for driving said conveyor in a step-by-step manner in response to system demands and in synchronism to movement of said partially completed muffler through said system, a plurality of spaced support means carried by said conveyor for supporting said partially completed muffler during passage between an inlet and an outlet, said support means being carried by said conveyor in a manner such that upon movement of the conveyor

one of said support means is positioned to receive at said inlet said partially completed muffler from an immediately preceding stage, means in said conveyor path for moving said partially completed muffler from one of said support means to the next adjacent support means, a member protruding into the path of movement for engaging said partially completed muffler when moving said partially completed muffler from said one support means to the next adjacent support means for reorienting said partially completed muffler from a position at the inlet to a second position, and outlet means for passing said reoriented muffler to a following stage of said system.

3,907,103
SAFETY CONTAINER
Howard G. Shaw, 24 Walnut Ave., Ross, Calif. 94957
Filed July 16, 1973, Ser. No. 379,633
Int. Cl. B65d *43/16, 55/02*
U.S. Cl. 206—1.5 **8 Claims**



1. In a safety container, a generally rectangular bottom wall; upstanding front, rear and side walls encompassing the bottom wall and cooperating therewith to form a receptacle; a lid forming a closure for the receptacle, said lid being movable between closed, partially open, and open positions; hinge means mounting the lid to the rear wall and urging the lid toward its open position; first releasable latch means carried by the lid and a first one of the upstanding walls for holding the lid in its closed position; and a second releasable latch means carried by the lid and a second one of the upstanding walls for holding the lid in its partially open position; said first and second latch means being enclosed within the container and inaccessible from outside the container when the lid is in its closed position; said first and second walls being fabricated of a pliant material and adapted for bowing outwardly to release the respective latch means when inwardly directed pressure is applied to the walls adjacent thereto.

3,907,104
COMBINATION SHIPPING CASE AND SHELF EXTENDER DISPLAY ASSEMBLY
Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust U/A, Chicago, Ill.
Filed June 24, 1974, Ser. No. 482,317
Int. Cl.[2] B65D *5/52, 25/00*
U.S. Cl. 206—45.23 **6 Claims**

1. A combination shipping and shelf-hanging display case comprising

a box body constituting an open-top container for packaging articles therewithin,

said container having a floor, a rear wall and a pair of side walls,

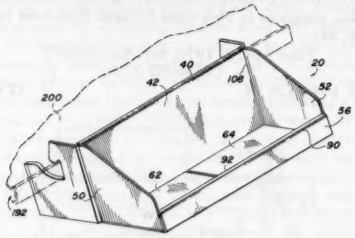
a cover including a top wall and a pair of opposed end walls connected thereto,

said cover adapted to serve both as a closure for said container to confine the articles within said container during shipment thereof and as a hanger to support said container on a shelf for display of articles contained therein when said case is in an open position,

hinge means integrally formed with an interconnecting said container with said cover for articulated pivotal movement therebetween,

said cover being pivotal about said hinge means between a first position in which said case is closed and a second position in which said case is open,

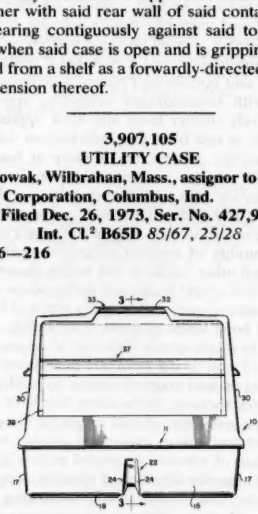
said hanger means including a pair of laterally spaced, shelf-engaging fingers integral with said end walls, said fingers defining terminal edges presented generally downwardly toward and bounding at least a portion of said openings formed in said end walls,



said terminal edges adapted to engage the shelf at an upwardly presented surface thereof to bear thereupon as the shelf edge projects through said openings when said container is open and said cover hangs upon and depends from the shelf,

said top wall of said cover defining a positive abutment and substantially coextensive support for said rear wall of said container with said rear wall of said container overlying and bearing contiguously against said top wall of said cover when said case is open and is grippingly secured to depend from a shelf as a forwardly-directed article-carrying extension thereof.

3,907,105
UTILITY CASE
Ralph M. Nowak, Wilbrahan, Mass., assignor to Tucker Manufacturing Corporation, Columbus, Ind.
Filed Dec. 26, 1973, Ser. No. 427,922
Int. Cl.[2] B65D *85/67, 25/28*
U.S. Cl. 206—216 **5 Claims**



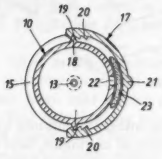
1. In a utility case, a first molding comprising a pair of elongated laterally spaced compartments, a pair of uprights interconnecting said compartments at their opposed ends and projecting upwardly therefrom, and an elongated strut interconnecting the upper ends of said uprights, said uprights having aligned openings formed therein intermediate their heights; and a second molding comprising an elongated bar adapted to support a roll of dispensable material and extending between said uprights and projecting outwardly from uprights through the openings therein, said bar having a pair vertical side walls, said side walls having notches formed in the lower edges thereof at the opposed ends of said bar for recep-

tion over the lower edges of said openings in the uprights for removably mounting said bar on said uprights.

3,907,106
COMPOUNDING VESSEL

Robert Purrmann; Werner Schmitt, both of Starnberg; Peter Jochum, Hechendorf, and Rainer Grimm-Lenz, Seefeld, all of Germany, assignors to E S P E GmbH, Seefeld, Germany

Filed May 15, 1973, Ser. No. 360,532
Claims priority, application Switzerland, May 31, 1972, 008066/72
Int. Cl.² B65D *81/32*
U.S. Cl. 206—219 **10 Claims**

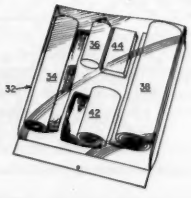


1. An apparatus for mixing at least two components in precise proportions comprising a main mixing chamber containing one component of the mixture, at least one supplementary chamber containing an additional component of the mixture, said chamber being defined by a radially inwardly movable wall embracing in movable relationship thereto, the outer wall of the main chamber, said outer wall being cylindrical, the movable wall conforming to the outer wall of the main chamber, the supplementary chamber communicating with the main chamber through an opening in the wall of the main chamber, the component in the supplementary chamber being sealed from the main chamber by a rupturable bag containing the additional component, said bag being placed over said hole, whereupon said bag, upon substantially reducing the volume of the supplementary chamber, abruptly ruptures to allow the additional component to enter the main chamber, means for rupturing the bag comprising external pressure applied in the direction of the wall of the main chamber, whereby the bag is ruptured and the volume of the supplementary chamber is reduced substantially to zero, and a means for retaining the movable wall in a terminal position against the main chamber, comprising axially disposed ribs which engage corresponding notches provided in the movable wall.

3,907,107
DRESS FORM METHOD AND MEANS

Flora M. Vercollone, 17A Ginn Rd., Winchester, Mass. 01890

Filed May 28, 1974, Ser. No. 473,682
Int. Cl.² B65D *69/00, 71/00*
U.S. Cl. 206—223 **2 Claims**

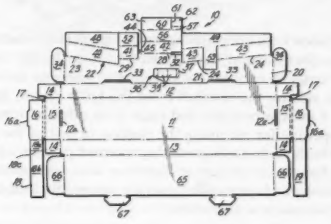


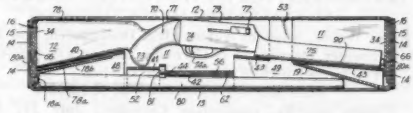
1. A kit for making a custom dress form comprises in combination a packaging container containing a stretchable, tubular jersey for wearing on a model's torso, a sheet of thin, flexible fabric material of sufficient size to form the components of a standard garment pattern, a container containing a spray adhesive for application to the fabric material to adhere the material to the jersey, a sheet of fabric-foam laminate material comparable in size to the sheet of fabric material, and instructions for combining the materials and adhesive and jersey to make the form.

3,907,108
CARTON FOR SHOTGUN OR THE LIKE

Charles P. Weimer, Jr., Plainfield, Conn., assignor to International Paper Company, New York, N.Y.

Filed June 25, 1974, Ser. No. 482,855
Int. Cl.² B65D *5/44, 5/48, 5/50, 85/20*
U.S. Cl. 206—317 **64 Claims**





1. A carton blank comprising:

a bottom panel with attached end walls and a front and rear wall;

a top panel attached along a first edge to the front wall, and having an opposed discontinuous edge including an intermediate segment which is substantially parallel to the first edge;

vertical panels attached to the discontinuous edge of the top panel, the vertical panel attached to the parallel segment of the edge having a cut-out portion therein which is substantially perpendicular to the parallel segment of the edge and is adapted to form a slot in the vertical panelling when the blank is erected into a carton; and

inner bottom panels attached to at least one of the vertical panels.

13. The blank of claim **12** wherein the discontinuous edge of the top panel includes segments at each end thereof angled with respect to the first edge, and wherein the reinforcing panel is cut from the portion of the top panel between its first edge and one of its angled segments.

3,907,109
CONTAINER FOR REELED FILM OR MAGNETIC TAPE

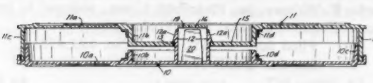
Fernando Primicerio, and Vincenzo Rispoli, both of Naples, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 17, 1974, Ser. No. 461,729
Claims priority, application Italy, Apr. 27, 1973, 49698/73
Int. Cl.² B65D *85/67*
U.S. Cl. 206—406 **7 Claims**

1. A reel container comprising a base and a cover, each of which comprises a generally flat sidewall and upstanding inner and outer cylindrical rims which cooperate to provide an annular space for receiving and positioning a reel, the sidewall of the cover having an annular recessed portion within its

inner rim and a handle across the diameter of the recessed portion, characterized in that:

projecting from and integral with the central portion of the base sidewall are at least a pair of opposed latch keys, the outer surface of each having a notch which mates with a latch plate provided by a central opening in the recessed portion of the cover to latch the cover to the base,



the latch keys are resiliently movable toward each other and project beyond the recessed portion of the cover sufficiently to enable one's fingers to squeeze them together to release the notches from the latch plates, and

the handle is box-like and each of its sides is formed with an opening for receiving the portion of one of the latch keys which projects beyond the recessed portion of the cover when the container is closed so that said projecting portions can be squeezed and the cover lifted off the base in one continuous motion.

3,907,110

ARRANGEMENT FOR IDENTIFYING CUSTOMER FILMS AND EVALUATING MEANS THEREFOR

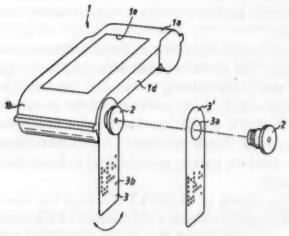
Klaus Weber, Munich; August Hell, Deisenhofen, and Horst Schneider, Horrem, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 20, 1973, Ser. No. 381,888

Claims priority, application Germany, July 21, 1972, 2235779

Int. Cl.[2] B65D *79/00, 39/04;* **G09F** *3/08*

U.S. Cl. 206—459 **16 Claims**



1. In combination with a receptacle confining customer films and having coupling elements in the form of sockets, and arrangement for facilitating the identification and manipulation of films confined in such receptacles, said arrangement comprising an elongated substantially flat carrier of information pertaining to the nature of processing the customer films and to the customer, said carrier having in the region of one end thereof a circular aperture; and attaching means for releasably securing said carrier to a receptacle, said attaching means having a coupling portion fitting the coupling element of the receptacle and a substantially circular second portion extending with sufficient clearance through said aperture to allow said carrier to assume a position dictated by gravity with respect to the receptacle to which it is secured.

3,907,111

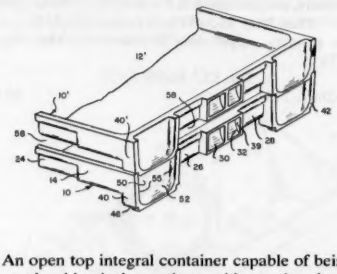
SELF-CLEANING STACKABLE CONTAINER

Alvin W. Levenhagen, Linesville, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 14, 1973, Ser. No. 370,153

Int. Cl. B65d *21/02*

U.S. Cl. 206—511 **9 Claims**



1. An open top integral container capable of being stacked with another identical container, said container having a substantially horizontally extending bottom interconnecting four substantially upright sides, a plurality of downwardly extending legs projecting outwardly from said sides, each of said legs having a directly upwardly and outwardly open recess formed therein for receiving the leg of an identical container in a stacked position thereon, the surfaces defining each of said recesses being smoothly continuous and including no upwardly facing horizontal portions.

3,907,112

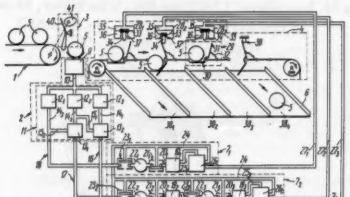
AUTOMATIC MACHINE FOR CLASSIFYING EGGS INTO WEIGHT CATEGORIES

Vyacheslav Dmitrievich Shepovalov, Staro-Petrovsko Razumovsky proezd, 6, korpus 1, kv. 78; Alexandr Vasilievich Fedorov, ulitsa Akademika Koroleva, 30, kv. 65; Anatoly Grigorievich Puzankov, Beskudnikovsky bulvar, 5, kv. 51; Viktor Alexeevich Khmyrov, Belomorskaya ulitsa, 12, kv. 41, all of, Moscow; Eduard Petrovich Delokas, ulitsa Moskovskaya, 76, korpus 1, kv. 41, Pyatigorsk; Igor Danilovich Agafonov, ulitsa Moskovskaya, 76, korpus 1, kv. 37, Pyatigorsk; Evgeny Ivanovich Bataev, ulitsa Khetagurova, 37, kv. 7, and Boris Shugaibovich Khabatov, ulitsa Moskovskaya, 76, korpus 1, kv. 43, Pyatigorsk, U.S.S.R.

Continuation of Ser. No. 343,164, March 20, 1973. This application Dec. 27, 1973, Ser. No. 428,859

Int. Cl. B07c *5/18*

U.S. Cl. 209—121 **8 Claims**



1. In a system for automatically classifying eggs according to the weight thereof, including apparatus comprising:

feed conveyer means for transporting eggs to be classified;

weighing means disposed to receive eggs from said feed conveyor means for individually weighing the eggs and determining the weight category of each egg with respect

to a plurality of predetermined possible weight categories, said weighing means being provided with a separate output line and means for generating a pneumatic signal for each said weight category, a pneumatic signal being generated on one of said output lines upon each weighing; distributor conveyor means for receiving the eggs from said weighing means, said distribution conveyor means including a plurality of spaced apart egg-discharge gate means disposed along said conveyor means in the direction of travel thereof, each said gate means including means actuable by a control means therefor in response to a pneumatic signal for releasing an egg from the gate; stroke pulse generator means for generating a train of pneumatic timing pulses in which the interpulse spacing of said pulse train is integrally related to the distance between each discharge gate means of said distribution conveyor means at a given rate of feed of the conveyor means;

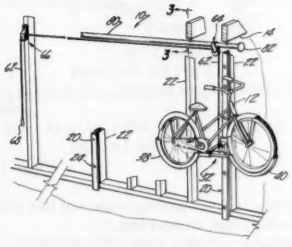
a plurality of delay lined each comprising a pneumatic counter means for counting a respectively different number of timing pulses from said stroke pulses generator means, each delay line delaying the transfer of a pneumatic signal applied thereto for a time interval defined by said respective number of timing pulses, each delay line being operatively connected between a respective output line of said weighing means and a respective control means for an egg-discharge gate means.

3,907,113

MULTIPLE BICYCLE SUPPORT SYSTEM

Edward Kropelnitski, 5409 Perry Rd., Grand Blanc, Mich. 48439

Filed Nov. 12, 1974, Ser. No. 523,142
Int. Cl.² A47F *7/04*
U.S. Cl. 211—19 **5 Claims**



1. A multiple bicycle support comprising a plurality of horizontally spaced rails disposed on a vertical wall;

bicycle support means slidably carried by each of said rails;

a first pulley fixedly mounted to said vertical wall at a position horizontally spaced from the last of said plurality of rails;

a second pulley mounted above said rails and slidably movable so as to be selectively positioned adjacent to any one of said rails;

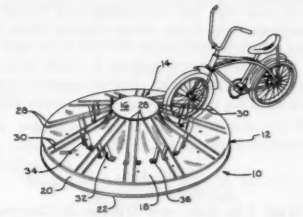
a cable carried by said pulleys having means at one end for engaging, selectively, each of said bicycle support means so as to raise said bicycle support means along its associated rail to a desired position; and means carried by said associated rail for locking said bicycle support means at said raised position.

3,907,114

CIRCULAR BICYCLE RACK

Ronald L. Ewers, Litchfield, Mich., assignor to Game Time, Inc., Litchfield, Mich.

Filed Dec. 12, 1973, Ser. No. 423,993
Int. Cl.² A47F *7/04*
U.S. Cl. 211—20 **3 Claims**



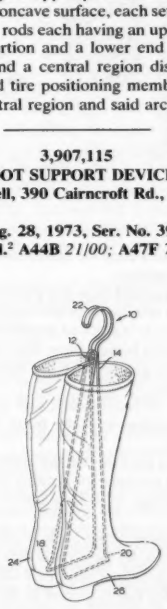
1. A bicycle rack comprising, in combination, a sheet metal base member, said base member having a circular outer peripheral region and a concentric circular central region having a center, an annular arcuate concave surface defined in said base member intermediate said peripheral region and said central region having a center of generation at, and symmetrical to, said central region center, said central region including an upper portion disposed at a higher vertical location than said outer peripheral region, a plurality of sets of bicycle wheel retaining rods extending between said peripheral region and said central region upper portion and vertically spaced above said arcuate concave surface, each set comprising a pair of spaced elongated rods each having an upper end supported upon said upper portion and a lower end supported at said peripheral region and a central region disposed above said arcuate surface, and tire positioning members extending between each rod central region and said arcuate surface.

3,907,115

BOOT SUPPORT DEVICE

Helen Spence Satchell, 390 Cairncroft Rd., Oakville, Ontario, Canada

Filed Aug. 28, 1973, Ser. No. 392,207
Int. Cl.² A44B *21/00;* **A47F** *7/08*
U.S. Cl. 211—34 **1 Claim**



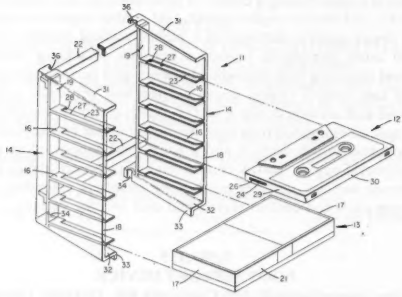
1. A boot support device for supporting the flexible leg portions of a pair of boots in an upright position comprising: a frame having a pair of elongated leg members adapted to be inserted one into each leg portion of a pair of boots arranged in a side-by-side relationship, said leg members having an upper end and a lower end, said leg members being rigidly connected at their upper ends and extending downwardly therefrom in sufficiently close proximity to one another to

clamp the leg portions of a pair of boots therebetween, said leg members having a sufficient length to extend longitudinally over substantially the full length of the leg portions of a pair of boots to be supported thereby to support the leg portions in an upright configuration, said frame being resiliently deformable to permit said leg members to move away from one another to receive the leg portions of a pair of boots therebetween, suspension hook means extending upwardly from said upper end of said legs for suspending said frame from an overhead support, said frame being formed from a unitary wire member which is bent upon itself to form said legs and suspension hook, said legs diverging in width in a direction towards the lower end thereof to provide a greater width at the lower end of each leg member than at the upper end of each leg member.

3,907,116
CASSETTE RACK

Irving W. Wolf, Palo Alto, and William E. Carpenter, Half Moon Bay, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed June 4, 1973, Ser. No. 366,726
Int. Cl.[2] A47G *29/00*
U.S. Cl. 211—40 **2 Claims**



1. A pair of holders each for boxed and unboxed magnetic tape cassettes comprising:

a pair of spaced parallel rack side pieces including confronting shelves for holding opposite ends of a number of said boxed cassettes in a stacked arrangement;

each of said shelves being spaced from the adjacent shelves for a dimension greater than the thickness of one of said boxed cassettes;

said holder also including back wall portions for aligning said boxed cassettes with the fronts thereof in the same vertical plane;

said shelves being cut away on the upper portions thereof to define nesting recesses for holding opposite ends of said unboxed cassettes in said stacked arrangement when desired;

said nesting recesses being each in part defined by a forwardly and upwardly facing rear face at a dimension from the front of said holder such that said unboxed cassettes are held with the fronts thereof in the same vertical plane as the fronts of said boxed cassettes when the latter are engaging said back wall portions;

spacing means extending between said side pieces for securing said pieces in said spaced parallel condition;

said side pieces being formed with a pair of parallel planar side walls, and said back wall portions being formed as flanges integral with said side walls and extending toward one another to prevent rearward sliding of at least said boxed cassettes off said shelves at the back portion thereof;

each of said side pieces having a pair of top walls and a pair of bottom walls formed as flanges integral with said side walls and said back wall portions and each of said top and bottom wall pairs extending toward one another so as to present confronting sides and edges, respectively;

each of said holders having corresponding identical key protrusions and keyway cutouts disposed for mating with the keyway cutouts and key protrusions of the other holder, for locking said holders together in an assembly configuration;

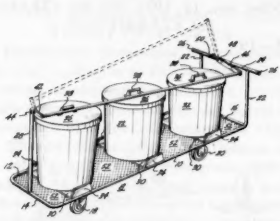
said keyway cutouts and key protrusions being in said top and bottom walls, particularly for locking said holders against relative horizontal movement in a vertically stacked assembly configuration; and

said protrusions for each holder including downwardly turned flanges formed at the confronting edges of said bottom walls, said last-named flanges being adapted for fitting between and snugly against the confronting sides of the top walls of the other holder when said other holder is stacked therebelow.

3,907,117
CART FOR LIDDED CANS

Robert J. Williams, 316 31st Ave., Seattle, Wash. 98122

Filed Nov. 29, 1973, Ser. No. 419,953
Int. Cl. A47g *29/00*
U.S. Cl. 211—71 **3 Claims**



1. A mobile rack for garbage cans and like containers having loose-fitting lids, comprising:

an elongated, wheeled cart-frame adapted to transport a plurality of containers;

an upright post medially located at one end of said cart frame;

transverse the other end of said cart-frame an upright arch frame;

said cart-frame including means between said post and said arch-frame to support said plurality of containers in a row substantially centered longitudinally of said post;

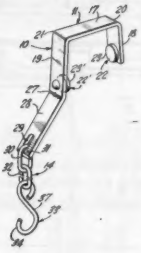
an elongated U-shaped hold-down extending between said post and said arch frame, and comprising a bar normally disposed in overlying relation to the lids of garbage cans supported on said cart; and

said hold-down also comprising an arm on each end of said bar, one of said arms being pivotally connected to said post and the other of said arms being pivotally connected to said arch-frame whereby said bar may be swung in an arc about the axis established by said pivotal connections of said arms, one of said arms on said bar being longer than the other said arm.

3,907,118
UNIVERSAL HANGER

Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation, New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 460,247
Int. Cl.² A47F *5/08*
U.S. Cl. 211—113 **4 Claims**

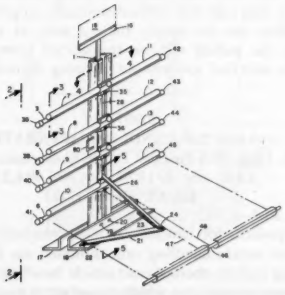


1. A hanger for suspending an item from any shape support comprising a mounting bracket supportable for any shape support and means connected thereto for releasably suspending one or more of said items; said mounting bracket comprising a substantially linear chord and a pair of downwardly turned lugs, respectively depending from opposed ends of said chord at substantially oblique joints relative thereto, one of said lugs being foreshortened relative to the other, a cantilevered arm fixedly connected to the longer of said pair of lugs, said cantilevered arm depending from said longer lug at an obtuse angle relative thereto, and a thrust bearing journalled into each of said lugs, each thrust bearing including a bearing pad engageable with a surface of said support; said free end of said cantilevered arm having a slot therein for connecting said suspension means thereto; said suspension means comprising a link chain having a first link fixedly connected through said slot in said free end of said cantilevered arm for pivotable, rotatable and slidable movement of said link chain about its connection with said cantilevered arm.

3,907,119
DISPLAY DEVICE

Leo J. Franz, Decatur, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 24, 1974, Ser. No. 473,264
Int. Cl.² A47F *7/00*
U.S. Cl. 211—49 S **3 Claims**

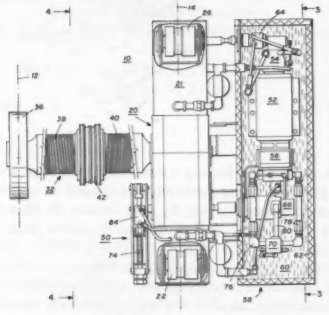


1. A display device comprising a flexible shelf element initially coiled into a plurality of concentric convolutions and having a mounting edge defining the outer extremity of the outer one of said convolutions, a rigid transverse elongated hollow mounting bar having a longitudinal slot formed therein slidably receiving said mounting edge of said shelf, said mounting edge of said shelf being of semi-rigid construction and being somewhat enlarged so that the width of said slot is less than the corresponding dimension of said enlarged mounting edge of said shelf element, and a vertical elongated hollow pedestal comprising an element having a longitudinal slot slidably receiving frictional mounting means secured to said mounting bar whereby said bar and shelf are supported by said pedestal.

3,907,120
HYDROSTATIC SYSTEM FOR OVERHEAD CRANE TROLLEY

Robert R. Johnston, Muskegon, and Walter Arnold Paulssen, Spring Lake, both of Mich., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 24, 1974, Ser. No. 463,471
Int. Cl.² B66C *17/00*
U.S. Cl. 212—26 **3 Claims**



1. A hydrostatic system for operating an overhead crane trolley comprising in combination:

a. a crane trolley supported overhead and operable when actuated to effect traversal and hoisting functions;

b. a sealed tank supported at the general elevation of the crane trolley and adapted to contain a fill of hydrostatic oil;

c. a plurality of components supported in said tank adapted to be submerged beneath the oil level thereof, said components including:

1. an electric motor;
2. a pair of pumps operably connected to said motor;
3. a first hydraulic motor connected to one of said pumps and adapted to actuate the hoisting function of said trolley; and
4. a second hydraulic motor connected to the other of said pumps and adapted to actuate the traversal function of said trolley;

d. control means to independently actuate said first and second hydraulic motors for independently effecting operation of their respective actuating functions;

e. a plurality of braking systems operably controlled by said tank supported components and operably interacting with each other, one of said braking systems being hydraulically responsive to forming of an oil trap thereto, another of said braking systems being dynamically responsive to reduction in hydraulic supply pressure within a closed hydraulic loop thereto, and still another of said braking systems being mechanically operable and comprising a pair of brake shoes movable into and out of braking relation with a braking surface and a hydraulic unit operably connected to said brake shoes and effective when energized to actuate said shoes toward said braking relation; and

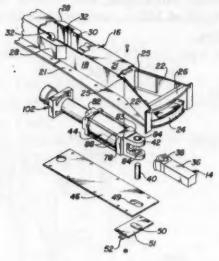
f. flow control means introducing a controlled time delay in energizing said hydraulic brake unit following occurrence of events requiring said mechanical braking system to be actuated.

3,907,121

FORCE TRANSMITTING MEANS FOR A RAILWAY CAR CUSHIONING DEVICE

Ross G. Carle, and Richard G. Powell, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,331
Int. Cl.² B61G 9/02
U.S. Cl. 213—8 **8 Claims**



1. A railway car having a center sill structure with an open outer end and being generally hat-shaped in cross section, a coupler structure carried by said center sill structure, a hydraulic cushioning device mounted within said center sill structure rearwardly of said coupler structure and having a relatively large diameter outer hydraulic cylinder connected to said coupler structure for longitudinal movement therewith, said cushioning device having a relatively small diameter cylindrical member extending rearwardly from said outer hydraulic cylinder and having a force transmitting member connected about its circumference, said hat-shaped center sill structure having a pair of spaced vertical sides each side having a cutaway portion receiving a reinforcement secured therein, said reinforcements being in opposed relation to each other and having inner surfaces forming continuations of the inner surfaces of the adjacent sides, said reinforcements projecting outwardly of the outer surfaces of said vertical sides and having inwardly facing opposed vertical slots therein, said force transmitting member having portions fitting within said inwardly facing slots whereby buff forces from said coupler are transmitted to said outer cylinder, thence to said relatively small diameter cylindrical member, and then laterally through said force transmitting member directly to the reinforcements of said center sill.

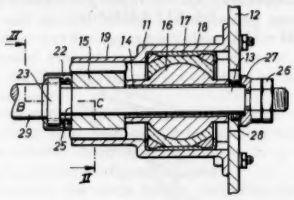
3,907,122

PUSH AND PULL DEVICE, ESPECIALLY FOR LIGHT RAIL VEHICLES AND CABIN VEHICLES

Klaus Ksieńysk, Remscheid-Lennep, and Barun Kumar Chatterjee, Remscheid, both of Germany, assignors to Bergische Stahl Industrie, Remscheid, Germany

Filed Aug. 21, 1974, Ser. No. 499,542
Claims priority, application Germany, Aug. 21, 1973, 2342099
Int. Cl.² B61G 5/00
U.S. Cl. 213—14 **9 Claims**

1. A push and pull device for light rail and cabin vehicles, which includes: housing means having a first section for connection to a vehicle frame and also having a second section with an inner substantially square cross section, a coupling rod extending through said first and second sections, an approximately ball-shaped body located in said first housing section and surrounding the adjacent portion of said coupling rod, elastic means interposed between said first housing section and said ball-shaped body and having the latter nesting therein, and elastic elements respectively arranged in the



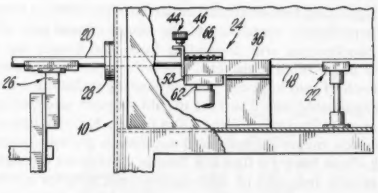
corners of the interior of said second housing section, that portion of said coupling rod which passes through said second housing section being elastically clamped between said elastic elements.

3,907,123

FUEL ROD PELLET LOADING HEAD

Thomas E. Howell, Pasco, Wash., assignor to Exxon Nuclear Company Inc., Bellevue, Wash.

Filed May 31, 1973, Ser. No. 365,507
Int. Cl. B65b 69/00
U.S. Cl. 214—1 BB **9 Claims**



1. In an assembly for the loading of nuclear fuel pellets into a fuel rod, including a main housing having an inert atmosphere and adapted to receive fuel pellets for loading into elongated fuel rods and a longitudinal extending trough for receiving pellets in end-to-end relationship, wherein the improvement comprises a pellet loading assembly disposed for longitudinal alignment with said trough and said fuel rod, said assembly including a member having a seat for slidably receiving fuel pellets longitudinally from said trough, means for providing relative adjustable vertical alignment between said fuel rod and said seat, said seat being constructed and arranged so that said seat will substantially tangentially contact said pellets for the length thereof only at two locations, whereby the pellets will be transferred from said loading trough to said fuel rod without chipping thereof.

3,907,124

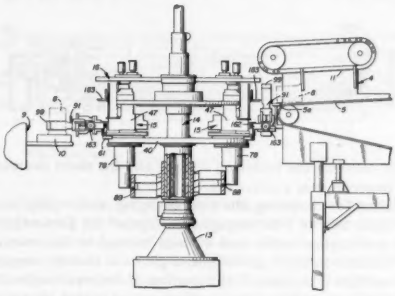
ARTICLE HANDLING APPARATUS

James B. Legg, 883 Pleasant Ridge, Columbus, Ohio 43209

Filed Aug. 2, 1974, Ser. No. 494,232
Int. Cl.² B65G 47/52
U.S. Cl. 214—1 BC **10 Claims**

1. Apparatus for handling articles comprising a rotatable turret, an article-handling unit mounted on the turret and extending radially thereof, said article handling unit including a tong unit having jaws which are adapted to grip the article with its axis extending therethrough, said tong unit being mounted on said article-handling unit for vertical swinging movement about a transverse pivot axis, said turret moving the article-handling unit between a loading station and a discharge station at angularly spaced positions around the turret, means for feeding an article to the tong unit at the loading

station with its axis substantially horizontal, support means at the discharge station for receiving the article released by the tong unit with its axis substantially vertical, means for swinging the tong unit about its transverse pivot axis causing it to be in a substantially vertical plane when at the loading station to receive the article with its axis substantially horizontal and to be in a substantially horizontal plane at the discharge station to permit release of the article with its axis substantially vertical, and means for operating said tong unit to open it to receive the article at said loading station, to close it to grip the



article during rotation of the tong unit with the turret, and to open the tong unit at the discharge station to release the article, said tong unit comprising a pair of pivoted cooperating jaws adapted to receive the article therebetween, said jaws being spread-apart in a substantially vertical plane at the loading station for receiving the article, means at said loading station for feeding the article axially into the spaced jaws with its axis substantially horizontal, and means beyond the jaws in the direction of feed for engaging the leading portion of the article as it is loaded into the spread jaws to aid in supporting it until the jaws close about it during movement of the turret.

3,907,125

APPARATUS FOR THE DELIVERY AND REMOVAL OF PALETTES PROVIDED WITH WORK-PIECES ON MACHINE TOOLS

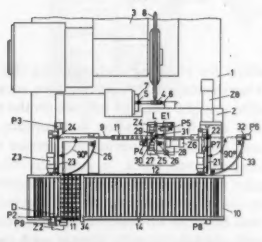
Ernst Seckinger, Zurich, Switzerland, assignor to Reishauer AG., Switzerland

Filed Sept. 11, 1974, Ser. No. 505,058

Claims priority, application Switzerland, Sept. 17, 1973, 13304/73

Int. Cl.[2] B65G *47/00*

U.S. Cl. 214—1 B **10 Claims**



1. Apparatus for the feed and removal of palettes provided with work-pieces to a loading and unloading device for a machine tool in which a work-piece is removed from the palette for processing and after processing is returned to its original position in the palette, said apparatus comprising:

a feed mechanism including a continuous chain conveyor;

longitudinally extending rail members connected to said chain conveyor and disposed transversely to the path of movement of said chain conveyor for carrying longitudinally extending work-piece palettes thereon, said rail members being disposed parallel to each other with uniform spacing therebetween, each of said rail members being adapted to carry one palette thereon;

means for advancing said chain conveyor in predetermined steps a distance corresponding to the spacing between said rail members;

a guide rail for receiving and moving a palette to and from a loading and unloading device, said guide rail including means thereon for cooperating with a palette for guiding the palette in a predetermined path of movement;

automatically actuatable means for guiding a palette from said feed mechanism to the loading and unloading device; and

automatically actuatable means for returning a pallet from said guide rail to said feed mechanism.

3,907,126

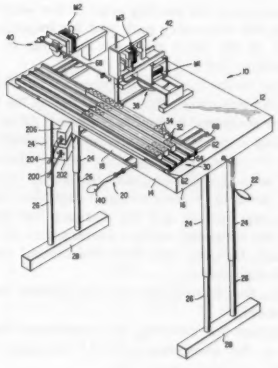
FEEDING APPARATUS FOR PHYSICALLY HANDICAPPED PERSONS

Garland S. Sydnor, Sr., 9 Stonehurst Green, Richmond, Va. 23226

Filed Oct. 23, 1974, Ser. No. 517,158

Int. Cl.[2] A47G *21/08*

U.S. Cl. 214—1 T **20 Claims**



1. A feeding apparatus for physically handicapped person which comprises:

a. table means for supporting the food to be served,

1. said table means having an aperture through which the food to be served is passed,

b. spoon means adapted to be positioned beneath said aperture in said table means,

1. means for moving said spoon means from a food-receiving position beneath said aperture in said table means to a position where the food on said spoon means may be consumed,

c. food receptor means in which the food to be served is received,

1. said food-receptor means being movable toward and away from said aperture in said table means whereby said food may be dispensed,

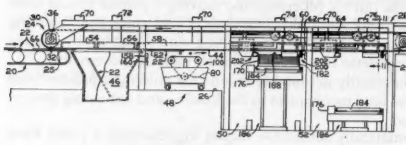
d. and touch-operated switch means for controlling said spoon means and said food-receptor means.

3,907,127

APPARATUS FOR STACKING SHEET MATERIAL

Dwight A. Bollinger, Hadley; William P. Cathers, Allison Park, and Harry S. Koontz, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 13, 1973, Ser. No. 424,507
Int. Cl.² B65G *57/00*
U.S. Cl. 214—6 DS **12 Claims**



1. In an apparatus for stacking individual sheets on a receiving surface wherein the apparatus is of the type having a loading position; conveying means movable along a path spaced above the receiving surface and the loading position for engaging successive, individual sheets at the loading station and for conveying the individual sheets toward the receiving surface; and means operating on the conveyor means for releasing the sheet therefrom to move the sheet along the trajectory path toward the receiving surface, the improvement comprising:

means mounted about the receiving surface for engaging the sheet as it moves along the trajectory path and for aligning the sheet with the receiving surface, said engaging and aligning means includes:

a first means mounted in the trajectory path of the sheet for engaging the leading edge of the sheet as it moves along the trajectory path and for imparting sufficient force to the sheet to move the sheet in an opposite direction; and

a second means in spaced alignment with said first engaging and imparting means for engaging the trailing edge of the sheet and imparting sufficient force to move the leading edge of the sheet into engagement with said first absorbing and imparting means wherein said first and second absorbing and imparting means confines the sheet to a reciprocating path spaced above the receiving surface and the distance between the sheet and the receiving surface decreases as the sheet reciprocates between said first and second absorbing and imparting means;

first means for cleaning the receiving surface prior to stacking a sheet;

second means for cleaning the uppermost surface of the sheet as the sheet engages said engaging and aligning means;

means for monitoring the movement of a sheet as it moves along the path from the loading position toward the receiving position; and

means responsive to said monitoring means for actuating the releasing means to release the sheet from the conveyor means to move the sheet along the trajectory path into engagement with said engaging and aligning means.

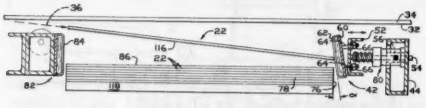
3,907,128

LEAD EDGE STOP DEVICE

William P. Cathers, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 13, 1973, Ser. No. 424,592
Int. Cl.² B65G *57/11*
U.S. Cl. 214—6 D **7 Claims**

3. In an apparatus for stacking a sheet onto a receiving surface lying in a generally horizontal plane wherein the stacking apparatus is of the type having means for conveying the sheet along a predetermined path toward the receiving surface; means for releasing the sheet from the conveyor to move the sheet free of support along the trajectory path toward the receiving surface; a first means mounted adjacent a side of the receiving surface and transverse to the trajectory path for engaging the leading edge of the sheet as the sheet moves along the trajectory path and for urging the sheet in a first direction over the receiving surface wherein the first direction is opposite to the direction of the trajectory path; a second means mounted opposite to the first engaging and urging means and adjacent to the opposite side of the receiving surface for engaging the trailing edge of the sheet as the sheet moves in the first direction and for urging the sheet in a second direction opposite to the first direction wherein the distance between the receiving surface and the sheet decreases, the improvement comprising:



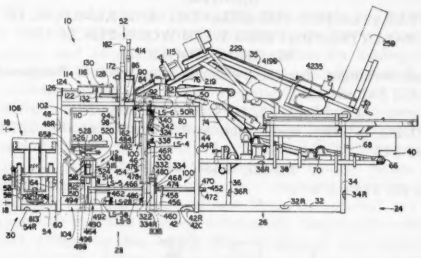
means for mounting the first engaging and urging means such that (1) the engaging surface of the first engaging and urging means and a plane normal to the receiving surface subtend an oblique angle such that the engaging surface is inclined over a portion of the receiving surface and toward the second engaging and urging means and (2) the engaging surface of the first engaging means extends from the trajectory path downward to the receiving surface.

3,907,129

STACKING AND BUNDLING MACHINE

Willis J. Stapp; Norman P. Crowe, and Edwin A. Molitor, all of Miami Twp., Clermont County, Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed June 5, 1974, Ser. No. 476,578
Int. Cl.² B65G *57/22*
U.S. Cl. 214—6 C **11 Claims**



1. A machine for stacking and bundling flat articles which comprises a horizontal stack receiving arm, means for forming a compressible upright stack of articles on the stack receiving arm with the articles extending horizontally, a horizontal presser means, means for lowering the presser means over the stack to compress the stack, a generally U-shaped basket having parallel spaced sides, means for mounting the basket for swinging about an upright axis and for swinging about a horizontal axis between an upright position in which the sides are horizontal and substantially aligned with the stack receiving arm and the presser means in stack compressed position and a lay-over position in which the sides of the basket are upright, means for pushing the stack from between the presser means and the stack receiving arm into the basket when the basket is in a first upright position with ends of the stack bearing on the sides of the basket and the stack being compressed between the sides of the basket, means for swinging the basket about the upright axis to a second upright position,

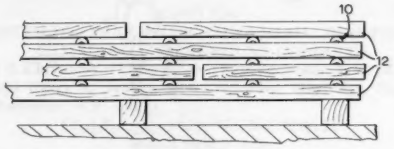
and means for swinging the basket to lay-over position to turn the stack to a position in which the articles in the stack are upright.

3,907,130

KILN STICKER

Dennis Hutcheson, 30 King St., Huntsville, Ontario, Canada

Filed July 8, 1974, Ser. No. 486,528
Claims priority, application Canada, Nov. 20, 1973, 186262
Int. Cl.[2] B65G *1/14*
U.S. Cl. 214—10.5 R **2 Claims**



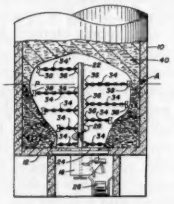
1. A kiln sticker for lumber having a top bearing and a bottom bearing to engage the under surface and top surface respectively of two spaced apart boards of stacked lumber, the transverse extent of said top bearing being substantially greater than a point whereby not to bruise the lumber, and substantially less than the width of said sticker to minimize sitcker shadow, the transverse extent of said bottom bearing being great enough to avoid bruising and substantially less in transverse extent than the width of said sticker to minimize sticker shadow, said bottom bearing being a composite bearing composed of two laterally spaced apart bearing surfaces, one adjacent each side edge of said sticker and each laterally disposed of said top bearing surface, said sticker being of solid cross section.

3,907,131

BOTTOM UNLOADING MEANS FOR SILO

James W. Lepley, Smithville, Ohio, assignor to Flying Dutchman, Inc., Smithville, Ohio

Continuation of Ser. No. 386,196, Aug. 6, 1973, Pat. No. 3,828,946. This application June 6, 1974, Ser. No. 477,072The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.
Int. Cl.[2] B65G *65/46*
U.S. Cl. 214—17 DA **12 Claims**



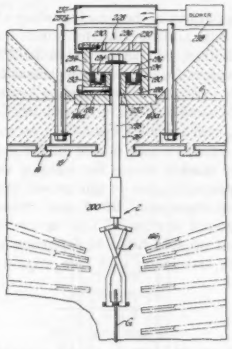
1. A silo unloader for a bottom unloading type silo having a discharge opening in a bottom wall thereof, said unloader including a shaft adjacent the center of said silo and extending upwardly of said bottom wall, auger means on said shaft adjacent to lower portion thereof for moving silage through said discharge opening in said bottom wall, motor means for rotating said shaft, a plurality of separate flexible dislodging members each supported at an inner end from said shaft at vertically spaced locations thereof, said flexible members having progressively increased lengths spaced upwardly of a shortest, lowermost member toward one or more maximum length flexible members supported from said shaft adjacent an intermediate level upwardly of said bottom wall, said maximum length flexible members having a length dimensioned so that outer ends thereof move around a path spaced inwardly of the interior surface of said silo upon rotation of said shaft with said flexible members fully extended outwardly of said shaft thereby forming a thin annular wall of silage around the periphery of said path, and one or more upper flexible members of a length shorter than said maximum length flexible members and spaced upwardly thereof on said shaft for forming an arched ceiling surface of a cavity developed within the silage in said silo by rotation of said flexible members upon rotation of said shaft, said cavity having a funnel-shaped lower surface in communication with said discharge opening formed by lower ones of said flexible members, said lower surface joining an inside surface of said thin annular wall of silage formed by rotation of said maximum length flexible members, said inside surface joining said arched ceiling surface formed by said upper flexible members, said thin annular wall of silage having a thickness preventing excessive compression of said silage therein and progressively collapsing to permit a gradual descent of a mass of silage in said silo above said shaft.

3,907,132

GLASS TEMPERING SYSTEM AND APPARATUS

Harold A. McMaster, 707 Riverside Dr., Woodville, Ohio 43469, and Norman C. Nitschke, 9102 Buck Rd., Perrysburg, Ohio 43551

Continuation-in-part of Ser. No. 365,939, June 1, 1973, abandoned. This application Jan. 21, 1974, Ser. No. 435,130
Int. Cl.[2] C03B *35/02;* **B61B** *13/12*
U.S. Cl. 214—18 R **39 Claims**



1. A system for treating glass sheet material and the like comprising: means defining a treatment zone; means defining a loading station at one end of said treatment zone; means defining an unloading station at the other end of said treatment zone; said treatment zone including a furnace with a top wall having a slot formed therein; a carrier for supporting material to be treated; conveying means including a drive conveyor for frictionally driving said carrier from said loading station through said treatment zone to said unloading station; said drive conveyor comprising a pair of spaced, parallel rails extending from said loading station to said unloading station through said treatment zone, said rails extending across the top wall of said furnace parallel to said slot, one rail being located on each side of said slot, and a pair of endless flexible chains one of said chains having one run supported on one of said rails, and the other of said chains having one run supported on the other of said rails, said chains each including a series of rollers connected by links, said links being pivotally

connected together in end to end relationship by pins defining the axles of said rollers; said carrier comprising at least one slide member bridging the space between said rails, said slide member being frictionally supported on the periphery of said rollers when said carrier is located on said drive conveyor, and said rollers on said one run of said chain also having their peripheries supported on said rail such that advancement of said one run of said chain causes rotation of the rollers to frictionally advance said slide member.

3,907,133

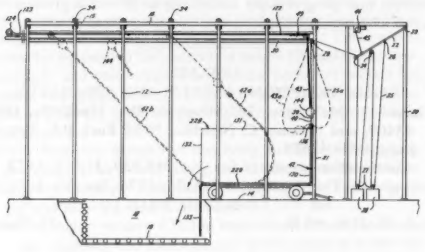
BULK CARGO UNLOADING MECHANISM

Eugene H. Brooks, Sherman, Tex., assignor to Hardwicke-Etter Company, Sherman, Tex.

Continuation-in-part of Ser. No. 413,551, Nov. 7, 1973, abandoned. This application Mar. 12, 1974, Ser. No. 450,344

Int. Cl.[2] B65G *67/24*

U.S. Cl. 214—44 B **7 Claims**



1. Unloading apparatus of the type including a frame and an apron with a free edge and a portion for horizontal disposition, in its loading position, for supporting a load beneath said frame, said frame forming an overhead track, a traveller on said track, flexible tension means extending from said traveller for attachment to said free edge, power means on said traveller for propelling said traveller oppositely on said track, and winch means operated by said power means and operatively connected to said tension means for winding and unwinding same whereby upon operation of said power means said free edge may be simultaneously lifted and drawn oppositely across said horizontal portion of said apron for selectively discharging a load on said horizontal portion of said apron and, subsequently, returning said free edge to its loading position.

3,907,134

WATER-FREE LIQUID FUEL SLURRY AND METHOD OF PRODUCING SAME

Grant W. Metzger, San Andreas, Calif., assignor to Carbonoyl Company, San Francisco, Calif.

Filed Feb. 27, 1974, Ser. No. 446,302

Int. Cl.[2] C10L *1/32*

U.S. Cl. 44—51 **3 Claims**

1. A substantially water-free, high solids content, stable and combustible fuel slurry comprising:

about 5 to about 50 weight percent of a solid particulate carbonaceous material of a size below about 200 mesh, about 94 to about 49 weight percent of a liquid hydrocarbon fuel, a minor slurry suspension stabilizing amount of starch, and a minor non-aqueous slurry viscosity reducing amount of soap and being present in an amount sufficient to maintain said slurry at a viscosity below about 300 seconds Saybolt Universal when said slurry is at a temperature of about 175°F, said liquid hydrocarbon fuel containing said starch and said slurry viscosity reducing agent and being thoroughly admixed with the particles of said carbonaceous material.

3,907,135

APPARATUS RELATING TO THE ORIENTATION OF ELONGATED ELEMENTS

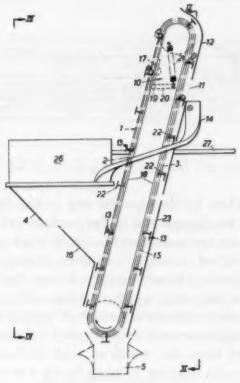
Peter Populin; Louis Populin, both of Groper Creek Rd., and Guiseppe Scalia, Woods Rd., all of Home Hill, Australia (4806)

Filed Feb. 28, 1973, Ser. No. 336,441

Claims priority, application Australia, Oct. 3, 1972, 8243/72; Jan. 15, 1973, 1900/73

Int. Cl.[2] A01C *7/00*

U.S. Cl. 214—83.36 **5 Claims**



1. Sugar cane planting apparatus comprising walls and a floor defining a billet-receiving bin, means for mounting the apparatus so that it is supported for movement across a field and along a planting path, billet supply conveyor means having a series of supply elements displacably mounted for movement in sequence through said bin for taking up billets from a mass of billets stored in the bin and moving these billets to a discharge point which is elevated relative to the floor of the bin, means for guiding and controlling the descent of the billets from the discharge point to a planting station disposed generally below the discharge point, the guide means having means for orientating the billets so that on release of a billet at the planting station its longitudinal direction extends substantially parallel to the planting path, the conveyor means comprises an endless moveable member having a forward run extending from the bin towards said discharge point and a return run extending downwardly to said planting station, said supply elements being mounted at spaced intervals on said moveable member, each supply element having a trough-like recess extending transverse to the direction of displacement thereof and dimensioned for accommodating one billet whereby as the supply elements are moved through said bin, a billet tends to be gathered in each trough-like recess, surplus billets tending to ball back into said bin, the moveable member comprising a pair of parallel spaced chains adapted to be driven over respective sprocket wheels, the supply elements being mounted at respective ends to the chains, a wall extending immediately behind said forward run, the planting station is below the bottom end of the return run, the conveyor means being adapted to be mounted with each conveyor element being inverted during transition from the forward run to the return run, whereby the billet mounted therein falls onto the upturned reverse side of the preceding supply element and is thereby lowered to be dropped and delivered to the planting station at the bottom of the return run, each conveyor element having the width and depth of its recess dimensioned such that more than one billet may be taken up and initially conveyed in the recess, the return run extending backwardly at an acute angle to the vertical direction and having a casing surrounding at least a portion of the return run, the reverse side of each supply element having a lip extending along its edge remote

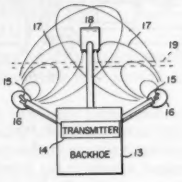
from the forward run such that only one of the billets received on the reverse side of a conveyor element is retained, the casing having an aperture arranged such that any billet in excess of the billet retained by the lip is maintained upstream of the aperture in a supported condition on the supply element by the casing, which is closely adjacent the lip of each supply element, and any excess billet rolls out through the aperture.

3,907,136

SYSTEM FOR PREVENTING DIGGING MACHINE FROM DAMAGING UNDERGROUND CONDUITS

Lee S. Christides, 47 Milrace Dr., East Rochester, N.Y. 14445, and Harry L. Jensen, 234 Crittenden Way, Apt. No. 1, Rochester, N.Y. 14623

Filed Dec. 26, 1973, Ser. No. 428,121
Int. Cl.[2] E02F *3/84*
U.S. Cl. 214—138 R **15 Claims**



1. A system for preventing a digging tool of a digging machine from damaging an underground conduit buried in a region where said tool is digging, said conduit having an electrically conductive path either from electrical conductivity of said conduit itself or from an electric conductor buried with said conduit to aid in detecting said conduit, said system comprising:

a. transmitter means for producing an oscillating current in said electrically conductive path;

b. a plurality of sensor inductors mounted on said digging tool in the region of a digging edge of said tool and oriented so that an electromagnetic field around said conductive path created by said induced current in said conductive path induces a voltage in said sensor inductors as said tool approaches said conductive path in any practical working orientation;

c. means responsive to each of said sensor inductors for producing a proximity signal relative to each of said sensor inductors as a function of the respective one of said voltages for each of said sensor inductors;

d. means for comparing said proximity signals;

e. means for producing an output signal whenever said proximity signals differ by a predetermined factor indicating approach of said tool to said buried conduit;

f. a reference inductor is mounted on said digging tool remotely spaced for said digging edge of said tool and oriented so that any ambient noise induces a voltage in said reference inductor, but said electromagnetic field created by said induced current in said buried conduit does not induce a detectable voltage in said reference inductor as said tool approaches said conduit in any practical working orientation; and

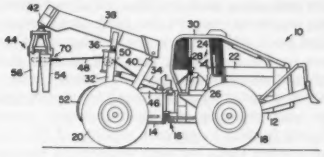
g. means for subtracting said voltage induced in said reference inductor from said respective voltages induced in said sensor inductors to obtain said proximity signals relative to each of said sensor inductors.

3,907,137

SHOCK ABSORBING CONNECTION BETWEEN A GRAPPLE AND A WINCH LINE

Adrian Charles Korbel, and Victor Charles Pierrot, III, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 16, 1974, Ser. No. 515,294
Int. Cl.[2] B66C *1/42*
U.S. Cl. 214—147 R **6 Claims**



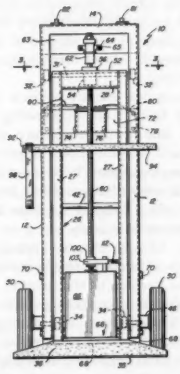
5. A grapple skidder for elongate loads including a vehicle having a main frame, load handling and skidding means carried by the vehicle and including elevating means, grapple means swingably suspended from the elevating means, said elevating means and grapple means being capable of elevating the leading end of an elongate load; a butt pan means on the rear end of the main frame; winch means on the main frame, a cable leading from the winch means and means releasably securing the cable to said grapple means whereby the latter may be pulled up against said butt pan to a transport position by actuation of said winch, the improvement conmprising: said means releasably securing the cable to said grapple means including yieldable shock absorber means for absorbing a predetermined load exerted on said cable by the winch means in excess of that required to snugly engage the grapple means with said butt pan.

3,907,138

POWER CONTROL HAND TRUCK

Chester E. Rhodes, Appleton, Wis., assignor to Woodward Mfg. & Sales Co., Inc., Appleton, Wis.

Filed July 2, 1973, Ser. No. 375,908
Int. Cl. B62b *1/06*
U.S. Cl. 214—370 **10 Claims**



1. A two wheeled hand truck assembly powered by a mounted electric motor for rapid and accurately controlled lowering and raising of a load, said hand truck having telescoping frame parts, and bearing means interconnecting said frame parts, the improvements which include:

the electric motor mounted at one end of a stationary frame part, lead means connecting said electric motor to a voltage source,

an elongated screw shaft rotatably connected to said elec-

tric motor at one end of said stationary frame part, the opposite end of said screw shaft being freely rotatable in a bearing mounted at an opposite end of said stationary frame part, a bearing nut mounted to a movable frame part intermediate the opposite ends of said screw shaft, said screw shaft engaging said bearing nut so that rotation of the screw shaft in a selected rotational direction either raises or lowers the frame part to which the bearing nut is mounted,

switch means to selectively actuate said electric motor to rotate said screw shaft in either rotational direction, and brake means to prevent the shaft from rotating under carried loads when said motor is deactuated, said brake means having a member mounted to said shaft and a frame part member engagable at all times with said shaft mounted member when said hand truck is operative, said frame part engaging said shaft mounted member with sufficient friction to prevent rotation of the screw shaft under carried loads but with insufficient friction to prevent override from the torque of the actuated electric motor.

3,907,139

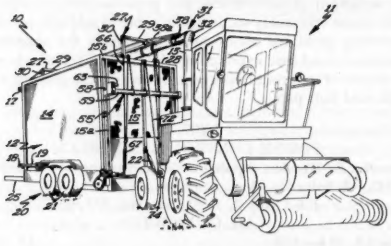
STACK FORMING DEVICE

Gene A. Luscombe, R.R. 1, Dolliver, Iowa 50531

Continuation-in-part of Ser. No. 353,699, April 23, 1973, Pat. No. 3,840,134. This application Oct. 7, 1974, Ser. No. 512,679

Int. Cl.² B60P 1/32

U.S. Cl. 214—518 **7 Claims**



1. A stack forming vehicle adapted to be towed by a prime mover and adapted to receive a chopped forage crop from a crop harvesting or crop pickup device of the type having a discharge spout through which the chopped forage crop is discharged, comprising:

a generally rectangular shaped vehicle body including a bottom wall, a front wall, upstanding substantially opposed vertical side walls, a closure structure shiftably mounted on said vehicle body adjacent the rear end thereof and being swingable between a closed position for closing the rear end of the vehicle body, and an open position to permit a formed stack to be removed rearwardly from the vehicle body,

ground engaging wheels, means connecting the ground engaging wheels with said vehicle body to permit travel thereof over the surface of the ground,

an elongate revolvable compacting roller extending transversely of said vehicle body and having a length dimension slightly less than the interior width dimension of the vehicle body, said compacting roller being reciprocable in a front and rear direction in the vehicle body along the surface of the forage crop during loading of the vehicle body to continuously compact the forage crop therein, an elongate guide structure engaged by said compacting roller and guiding the latter during its reciprocating movement,

drive means operatively connected with said compacting roller and being operable for reciprocating the latter,

a shiftable distributor mechanism in the vehicle body and adapted to be connected to the discharge spout of the crop harvesting device and being shiftable in a front and rear direction, said distributor being operable when shifted to evenly distribute the chopped forage crop into the vehicle body.

3,907,140

LIFT TRUCKS

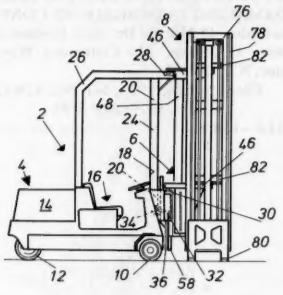
David Martin Jinks, Oadby, England, assignor to Cleco Industries Ltd., England

Filed Aug. 28, 1973, Ser. No. 392,300

Claims priority, application United Kingdom, Aug. 31, 1972, 40293/72

Int. Cl.² B66F 9/20

U.S. Cl. 214—671 **12 Claims**



1. A lift truck comprising a truck body, wheels supporting the truck body, a driver's station on the truck body and a pair of transversely spaced wheels at the front of the truck body; a fixed mast rigidly secured to the truck body and extending upwardly thereof to a level above the driver's station, at least one upper transversely extending member secured to the front of the fixed mast adjacent the upper part thereof above the forward field of view of the driver's station, at least one lower transversely extending member secured in a fixed position with respect to the truck body at the front and adjacent the lower part of the fixed mast;

a traverse carriage extending alongside the front of the fixed mast, rigidly interconnected upper and lower means on the carriage for slidably engaging the said upper and lower transversely extending members respectively, means for sliding the upper and lower means simultaneously from side to side of the truck body with respect to their respective transversely extending members, and upper and lower forwardly cantilevered members secured to the carriage at the level of the upper and lower transversely extending members respectively; a movable mast pivotably supported by the upper and lower forwardly cantilevered members at the level of the upper and lower transversely extending members respectively and pivotable about an upright axis, means for pivoting the movable mast on the upper and lower members from a forward facing position 90° to either side of the truck body and a load carriage for raising and lowering a load and supported at the front of the movable mast.

3,907,141

OPERATOR'S STATION OPTIONALLY STATIONARY OR ELEVATED

Donald A. Ahrendt, Chicago Heights, and Thomas J. Finlayson, Palos Hills, both of Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 27, 1974, Ser. No. 501,072

Int. Cl.² B66F 9/16

U.S. Cl. 214—701 P **14 Claims**

1. In a lift truck of the type having a main frame and front and rear wheels supporting said main frame, the combinations comprising:

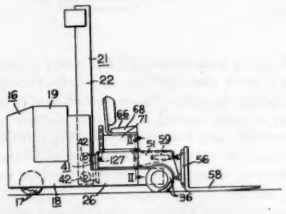
a vertical mast rigidly secured to said main frame intermediate said front and rear wheels and including a pair of uprights,

a carriage mounted on said mast for vertical reciprocal movement between a fully lowered position and a fully raised position including

a transverse carriage plate adjacent the front of said mast,

a pair of laterally spaced brackets rigidly secured to the rear of said transverse carriage plate and extending rearwardly therefrom,

rollers rotatably mounted on said brackets and cooperatively engaging said uprights whereby said carriage is connected thereto for vertical reciprocal movement,



a pair of laterally spaced longitudinally extending arms rigidly secured at their rear ends to said carriage plate, and

a transverse fork mounting plate connected to the front of said longitudinally extending arms, and

an operator's station mounted on said main frame independently of said carriage and disposed laterally between said arms and longitudinally between said plates, said operator's station being of sufficiently small lateral and longitudinal dimensions so as to permit said carriage to be elevated from its fully lowered position to its fully raised position without lifting said operator's station.

3,907,142

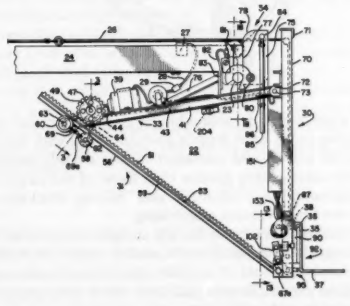
LIFTING ATTACHMENT FOR A CRANE

Forrest D. Welch, 1715 Stone St., Saginaw, Mich. 48602

Continuation-in-part of Ser. No. 175,170, Aug. 26, 1971, Pat. No. 3,760,963. This application May 10, 1972, Ser. No. 251,926

Int. Cl. B66f *9/06*

U.S. Cl. 214—763 **25 Claims**



1. A materials handling apparatus capable of being readily selectively attached to and/or detached from a boom of a crane which includes a control line, in such a manner that the apparatus is mobile with said boom to provide a lift capability to the crane controlled by the control line, said apparatus being free from supportive engagement with any support member of the crane other than the free end of the boom and comprising:

elevator means, said elevator means including a carriage assembly for transferring said loads supported on said carriage assembly from a first location to a second location displaced in height from said first location by operation of said control line;

leveling means for positively and mechanically selectively orienting said elevator means relative to a predetermined axis independent of said boom to selectively orient said carriage assembly and any loads thereon, wherein said leveling means is characterized as being operable while said boom is mobile, said leveling means being capable of selectively orienting said carriage assembly and said loads substantially throughout the range of throw of the boom; power means on said apparatus for selectively actuating said leveling means and readily connectible to a power source on said crane; and

securing means for securing said apparatus substantially as a unit to the boom of the crane, said securing means serving to rigidly attach said apparatus at a single point to the free end of the boom and being the only means of supporting and securing the apparatus to the boom.

3,907,143

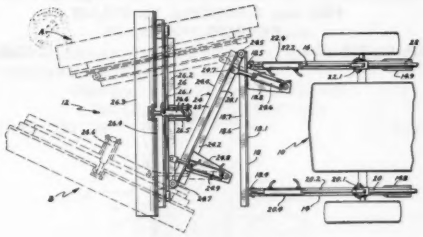
FRONT END LOADER FOR TRACTORS

Silas A. Brown, 9350 N. 31st St., Lake Elmo, Minn. 55042, and Herbert M. Brown, Box 5, Harrisburg, S. Dak. 57032

Filed Feb. 14, 1974, Ser. No. 442,633

Int. Cl.² E02F *3/74*

U.S. Cl. 214—768 **6 Claims**



1. A front end loader for a tractor comprising:

a. a pair of vertically movable, hydraulically actuated overhead booms carried longitudinally of the tractor and terminating in a transverse support bar connecting the booms forwardly of the tractor;

b. an earth-moving tool supported by a transverse tool frame;

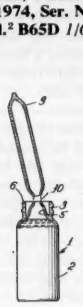
c. a connector bar extending between opposed ends of the transverse support bar and the tool frame and connected to said bar and frame by hinges permitting movement in a common plane of the tool frame and the transverse support bar; and

d. separately operable hydraulic jacks connecting respectively the tool frame to the connector bar and the connector bar to the transverse support bar, whereby the earth-moving tool may be extended forwardly of the tractor and retained in a position approximately perpendicular to the line of travel of the tractor or retracted rearwardly by concurrent operation of the hydraulic jacks, and may be faced to the left or the right with respect to the tractor by operation of one of the hydraulic jacks.

3,907,144
RESEALABLE HERMETIC VIAL

Lyle D. Winkler, 515 Kimball, Wauconda, Ill. 60084

Filed Jan. 21, 1974, Ser. No. 435,280
Int. Cl.[2] B65D *1/02*
U.S. Cl. 215—32 11 Claims

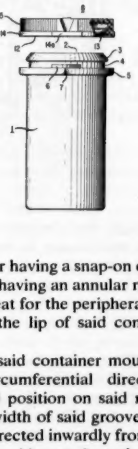


1. A resealable hermetic vial comprising a container body having a neck at the top thereof and means on said neck for securing a resealing closure cap thereto, a glass filler tube hermetically secured to the body-neck structure near the top thereof and extending upwardly therefrom, said tube having a score mark thereon at a level near the top of said neck to establish the level at which said tube is broken off when the filled and hermetically sealed vial is opened, and a closure cap having securing means adapted to cooperate with said securing means on said neck to sealingly close the broken-open filler tube at said score mark.

3,907,145
SAFETY CONTAINER INCLUDING SNAP-ON CAP

William Horvath, 10 Crestwood Dr., Watchung, N.J. 07060

Filed Aug. 5, 1974, Ser. No. 494,545
Int. Cl.[2] B65D *55/02*, *85/56*
U.S. Cl. 215—206 2 Claims



1. In a safety container having a snap-on cap with a depending skirt, said container having an annular rim near the mouth thereof which forms a seat for the peripheral edge of said cap, said rim forming with the lip of said container an annular groove,

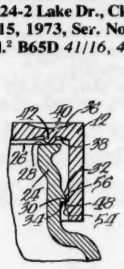
a first small cam on said container mouth having tapered sides in both circumferential directions, said cam mounted in a fixed position on said rim and extending across part of the width of said groove,

a second small cam directed inwardly from the periphery of the skirt of said cap, said second cam having tapered sides in both circumferential directions, and constructed for accommodation in the groove on said container mouth when said cap snaps into place locking said cap thereon, said cap constructed to open only when rotatively positioned relative to said container mouth so that said cams coincide, thereby distorting said cap, and permitting removal thereof by slight upward pressure from the thumb or fingers of the user.

3,907,146
PRIMARY CLOSURE

Mack Robert Fields, 1624-2 Lake Dr., Clearwater, Fla. 33516

Filed Nov. 15, 1973, Ser. No. 416,004
Int. Cl.[2] B65D *41/16*, *41/18*
U.S. Cl. 215—317 5 Claims

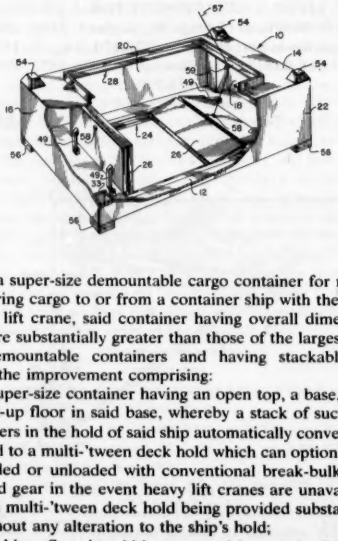


1. A safety attachment for a primary closure to a container having a neck portion with an axially facing planar lip, said neck portion having a flange spaced axially from said lip, said primary closure having a top wall portion and a depending skirt portion, said wall portion having a resilient web formed by a recess in one of the surfaces around the peripheral portion thereof, a depending bead formed on said web and projecting axially into the open area within the confines of said skirt portion and adapted to be aligned with said lip on said container, means on the inside surface of said skirt portion whereby said closure is permanently affixed to said container by forcing said means past said flange on said neck of the container so that said means lock below the flange and the web is deformed as it urges said bead into sealing relation with said lip on said container.

3,907,147
LARGE RIGID DEMOUNTABLE CARGO CONTAINER WITH OPEN TOP AND FOLD-UP FLOOR

Andrew R. Goobeck, 12512 Keynote Ln., Bowie, Md. 20715

Filed Mar. 22, 1973, Ser. No. 343,752
Int. Cl.[2] B65D *21/00*
U.S. Cl. 220—1.5 9 Claims



1. In a super-size demountable cargo container for rapidly transferring cargo to or from a container ship with the aid of a heavy lift crane, said container having overall dimensions which are substantially greater than those of the largest standard demountable containers and having stackable end frames, the improvement comprising:

said super-size container having an open top, a base, and a fold-up floor in said base, whereby a stack of such containers in the hold of said ship automatically converts the hold to a multi-'tween deck hold which can optionally be loaded or unloaded with conventional break-bulk overhead gear in the event heavy lift cranes are unavailable, said multi-'tween deck hold being provided substantially without any alteration to the ship's hold;

said fold-up floor in said base comprising a pair of bottom side rails, at least two cross members, a first hatch frame with a substantially continuous horizontal supporting

ledge fitted and secured to said bottom side rails and said cross members, and a first hatch cover fitted to said first hatch frame and supported about its periphery by said supporting ledge, whereby the static and dynamic loads imposed on said first hatch cover by said cargo are transmitted via said ledge, hatch frame and cross members to said bottom side rails and to said end frames of said container.

3,907,148

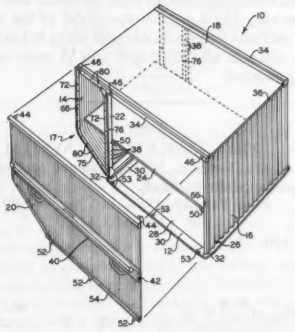
CARGO CONTAINER

Oscar W. Meller, and John W. Lovich, both of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 26, 1973, Ser. No. 428,593

Int. Cl.² B65D *87/00*

U.S. Cl. 220—1.5 **7 Claims**



1. In a cargo container having a base, a top parallel to the base, and end panels interconnecting the top and base at opposite ends thereof, the improvement comprising:

an extruded header beam interconnecting the two end panels and top and having at least three hinge receiving slots spaced therealong;

a number of hinges less than the number of slots received in certain of said slots and engaging a door pivotally suspended from the header;

a vertical beam interconnecting the top and base and defining a trapezoidal panel with the top and an end panel, each of the end panels having an extruded edge member connected to each vertical edge thereof, the vertical beam and one of the edge members having a plurality of holes therein for receiving and securing an end panel of trapezoidal shape thereover;

wherein the vertical beam and extruded edge members each have latch stud holes therein and wherein less than all of the latch stud holes receive studs therein; and

wherein the vertical beam and extruded edge members each have a groove therein running the entire length thereof, the grooves being adapted to receive weather sealing strips therein and less than all of the grooves receiving such strips.

3,907,149

PRESSURE VESSEL HAVING A SEALED PORT

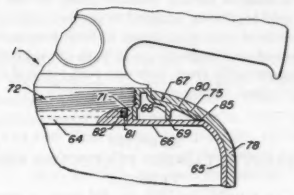
Emerson R. Harmon, Lisbon, Wis., assignor to Amalga Corporation, Menomonee Falls, Wis.

Continuation of Ser. No. 192,098, Oct. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 852,624, Aug. 15, 1969, abandoned. This application Feb. 19, 1974, Ser. No. 443,336

Int. Cl.² B65D *25/14;* **F17C** *1/00*

U.S. Cl. 220—3 **1 Claim**

1. A lined pressure vessel having a sealed port comprising, a resin impregnated fiberglass filament reinforced outer shell having an aperture therein at said port, a flexible inner liner having an annular lip extending outwardly within said port, a rigid annular boss having an interiorally threaded opening and having surfaces disposed between and in contact with the shell and liner at the sealed port and with the lower end of the boss free of threads and in engagement with the outside of the extending lip of said liner, said boss being solid along the outer surface and having concave hollows facing the liner of the vessel with at least one vertical flange on the inside of the boss extending toward the inside of the boss and into engagement with the liner to reinforce the boss, a valve assembly threaded



exteriorally and threaded into said boss and having a lower unthreaded portion in engagement with the inside of the lip of said liner, and a sealing means comprising a groove about said lower unthreaded portion of said valve assembly and an O-ring positioned therein and in engagement with the outwardly extending lip of the liner, and pressure inside said pressure vessel seals the O-ring to said lip thereby tightly sealing said port, the engagement of the lower unthreaded portion of the valve assembly with the lip of the liner being inwardly of the O-ring to prevent any possibility of extrusion of the O-ring into the vessel.

3,907,150

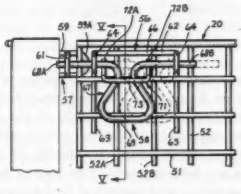
RIGID CONTAINER

Stanley J. Jurasek, Concord, Mich., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Jan. 15, 1973, Ser. No. 323,513

Int. Cl.² B65D *7/20;* **E05C** *5/02*

U.S. Cl. 220—19 **2 Claims**



1. In a material handling container having a movable wall of wire mesh configuration comprising horizontal and vertical rods, a latch structure for releasably securing the wall in an upright position, comprising:

a keeper device secured to the container comprising a loop portion projecting transversely of said wall;

a latch device attached to said wall for cooperation with said keeper device, said latch device comprising means defining a pair of loop portions adapted to be aligned with the loop portion of said keeper device when said wall is in an upright position, a latch member comprising a one-piece member having a pair of straight sections extending transversely through the loop portions of said latch device and mounted for pivotal and longitudinal sliding movement with respect thereto, the adjacent ends of said straight sections being connected by an intermediate generally U-shaped handle portion, whereby said latch device can be slid along said wall by moving said handle portion, and cooperating stop

means on said wall and said latch device for alternatively positioning said latch device in a position in which one straight section extends through the loop portion of said keeper device or a position in which said one straight section is located outside of the loop portion of said keeper device, said stop means including a stop member fixedly attached to said latch member for pivotal and sliding movement therewith, said stop member comprising a pair of upright legs secured to the inner sides of said straight sections and disposed on opposite sides of said U-shaped handle portion, and a horizontal connecting web integral at its ends with said upright legs and extending across and in front of said U-shaped handle portion close to the upper end thereof, said legs being adapted to project between and abut against vertical rods of said wall to limit longitudinal sliding movement of said latch device in both of said positions, said legs being movable from between said vertical rods to permit longitudinal sliding of said latch device.

3,907,151

INSULATION RETAINING PLATES FOR PRESSURE VESSELS

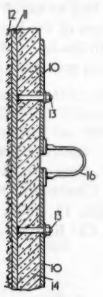
John Richard Gilden, Knutsford, England, assignor to The Nuclear Power Group Limited, Cheshire, England

Filed Dec. 11, 1972, Ser. No. 313,880

Claims priority, application United Kingdom, Dec. 10, 1971, 57553/71

Int. Cl. B65d *87/34, 13/04*

U.S. Cl. 220—63 R **6 Claims**



1. A pressure vessel for a nuclear reactor wherein there is provided an inner lining of a thermal insulation medium, the lining being retained on the inner walls of the pressure vessel by a plurality of separate metal cover plates which are held to the wall of the pressure vessel by means of studs, wherein adjacent plates are interconnected by two or more separated spring members being so connected to adjacent cover plates as to provide resilient flexibility only in the plane of the cover plate and stiffness in the other orthogonal planes.

3,907,152

END CLOSURES FOR METAL DRUMS

Eugene Wessely, Colombes, France, assignor to Gallay S.A., Paris, France

Filed May 31, 1972, Ser. No. 258,410

Claims priority, application France, June 9, 1971, 71.20846

Int. Cl.² B65D *7/42*

U.S. Cl. 220—66 **9 Claims**

1. A metal drum comprising a cylindrical body having steel metal end closures at both ends thereof, each said clousure having a cylindrical wall that fits inside the corresponding end of the cylindrical body of the drum, each said closure comprising a wall perpendicular to the axis of the cylindrical body of the drum and spaced axially inwardly from an outer edge of the cylindrical body, each said closure having a small downwardly opening rounded turnover channel interconnecting said cylindrical wall and said perpendicular wall, a connecting fillet in each end closure radially inwardly following said turnover channel, said perpendicular wall having at least one protective expansion zone projecting only inwardly into the cylindrical body of the drum in a direction opposite the associated outer edge of the cylindrical body of the drum, said at least one expansion zone comprising an inverted U-shaped expansible stiffening channel both the width and the height of which are very much greater than those of the said turnover channel, and said perpendicular wall being flat apart from said turnover channel and fillet and said at least one U-shaped stiffening channel.

3,907,153

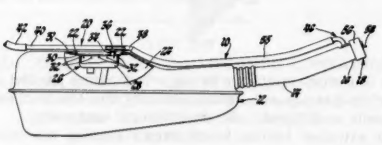
FUEL TANK VENTING SYSTEM

Paul R. Mutty, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1974, Ser. No. 443,801

Int. Cl.² B65B *31/00*

U.S. Cl. 220—86 R **4 Claims**



1. A fuel tank venting system comprising: a fuel tank having a vapor space and a filler pipe with an open end, cap means removably connected to the open end of said pipe, means defining a restricted vapor path from said tank, a vent pipe connected to said restricted path including a first open end adapted to be connected to a charcoal canister for absorbing fuel vapors and a second open end, means defining a refueling vent opening within said filler pipe connected to said second open end and having less restriction than said first vapor path for unrestricted flow of vapor from said tank and said filler pipe during a closed fuel fill phase of operation to reduce fill pressure build-up, and seal means operative when said cap means is in place on said filler pipe to block communication between said tank and said refueling vent opening so as to direct vapor flow from said tank through said restricted vapor path during vehicle operation.

2. A fuel tank vent system comprising: a fuel tank having a vapor space and a fuel filler pipe, means including a restricted orifice from said tank and a vent pipe adapted to be connected to a carbon canister for absorbing vapors from the tank, an unrestricted opening in said filler pipe for directing vapor from said tank during a closed fuel filling phase of operation, a fuel cap on said pipe for closing said pipe after fill, means within said filler pipe for sealing against said fuel cap thereon to effect a secondary seal between said tank and said unrestricted filler pipe vapor opening whereby vapor flow is directed only through said orifice when the cap is in place, and means for removing said secondary seal means during the closed fill phase of operation to allow vapor flow from said tank to pass through said unrestricted filler neck opening, and means for connecting said filler pipe vapor opening to said vent pipe whereby fuel vapors are directed to the charcoal

canister from the tank during the closed fuel fill phase of operation without undesirable increase in tank pressure.

3,907,154

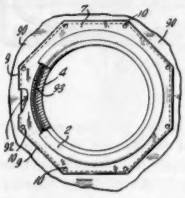
CONTAINER CLOSURE CONSTRUCTION

John Jesevich, Cicero, and Vyto Simkus, Chicago, both of Ill., assignors to American Flange & Manufacturing Co., Inc., New York, N.Y.

Division of Ser. No. 131,258, Apr. 5, 1971, Pat. No. 3,800,401. This application Oct. 25, 1973, Ser. No. 409,391

Int. Cl.[2] B65D *25/00*

U.S. Cl. 220—85 R **3 Claims**



1. A tag ring element for reinforcing a container wall opening surrounded by an upwardly drawn neck, said tag ring element providing identifying tag and closure seal affixing means and comprising a flat annular blank having an innermost free edge surrounding a circular central opening and terminating in an outermost free edge having a polygonal configuration consisting of a maximum number of eight sides, eyelets formed in corners of said base closely adjacent said free edge, said central opening having a diameter less than the diameter of said container wall opening neck wherein an inner portion of said annular blank is adapted to be drawn upwardly into a cylindrical neck closely overlying said container wall opening neck.

3,907,155

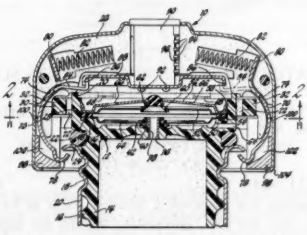
LOCKING FILLER CAP

Claude A. Smith, Sandusky, and Donald L. Williams, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,606

Int. Cl.[2] B65D *51/16, 55/14*

U.S. Cl. 220—210 **2 Claims**



1. A locking filler cap for use on a fuel tank filler neck having an inner helical thread and an outwardly extending flange, said cap comprising a body member having an outer helical thread about its lower end adapted to mate with said filler neck thread, a seal carried by said body member and adapted to engage said filler neck, a pair of semicircular shell members received about and overlying the upper end of said body member, said shell members defining a circular track having a plurality of projections thereon, said body member having a plurality of fingers biased into engagement with said track, engagement of said fingers and said projections providing a torque limiting coupling between said shell members and said body member whereby said body member may be applied to and removed from said filler neck by rotating said shell members, said shell members defining a pair of guideways, a pair of latch members carried in said guideways, means biasing said latch members to extend under said flange whereby said latch members prevent removal of said cap from said filler pipe, a cam member engaging said latch members and carried between said body member and shell members, and a lockable member connected to said cam member for driving said cam member to thereby pull said latch members out from under said flange whereby said cap may be removed from said filler pipe.

3,907,156

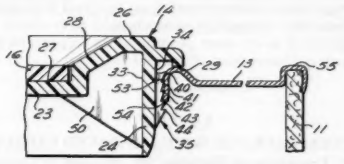
CONTAINER END CLOSURE WITH METAL PLATE

Albert J. Weatherhead, III, Shaker Heights, Ohio, assignor to Weatherchem Corporation, Twinsburg, Ohio

Continuation-in-part of Ser. No. 328,876, Feb. 1, 1973, Pat. No. 3,874,580. This application June 20, 1974, Ser. No. 481,164The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl. B65d *39/00*

U.S. Cl. 220—307 **10 Claims**



1. In combination, an end closure and a metal plate, said metal plate including an axially extending marginal wall terminating at a marginal edge and defining an opening, and said end closure being plastic and including a laterally extending end portion, an annular skirt portion extending axially from said end portion, said skirt portion having an inner surface and a generally smooth outer surface being received within said marginal wall, and a plurality of relatively narrow locking means disposed in peripherally spaced positions holding said skirt portion in said marginal wall, each of said locking means including a plurality of axially spaced locking barbs extending radially outwardly from said outer surface and terminating at an outermost barb surface, reinforcing strut means extending from said end portion to said inner surface immediately adjacent said locking barbs and acting against radially inward movement of said locking barbs, said marginal wall radially engaging and radially inwardly deforming said outermost barb surface of at least one of said barbs disposed nearer to said end portion, and said marginal edge axially engaging at least one of said barbs disposed farther from said end portion to lock said end closure onto said metal plate.

3,907,157

LOCKING DEVICE

David Anthony Beattie, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1974, Ser. No. 451,692

Claims priority, application United Kingdom, Apr. 3, 1973, 15828/73

Int. Cl.[2] B65D *45/00*

U.S. Cl. 220—327 **6 Claims**

1. A pressure vessel safety lock comprising:

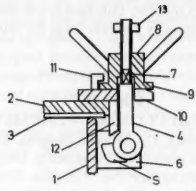
a swing bolt pivotally mounted to a pressure vessel so as to be movable to opened and closed positions wherein said swing bolt comprises a mounting portion having a shaft

extending therefrom, said shaft having a threaded top portion having a nut member thereon,

a stop device attached to said mounting portion,

a lid for said vessel,

a bracket fixed to the lid, said bracket having two arms extending away from the lid defining a slot therebetween, at least one projection attached to the bottom of said bracket and extending downwardly therefrom beyond said lid,



means mounted on said bracket and adapted to engage said nut member so that said means are engaged by said nut member to close said lid upon tightening of said nut member and engaged by said nut member upon loosening of said nut member to raise said lid,

said stop device being mounted on said bolt such that said at least one projection contacts said stop device when said bolt is in an open position so as to prevent further downward movement of said lid.

3,907,158

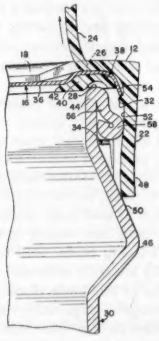
VACUUM PACKAGE WITH IMPROVED CLOSURE

Henry E. Frankenberg, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,132

Int. Cl.[2] B65D *43/10*

U.S. Cl. 220—352 **10 Claims**



1. The composite closure for press-on application and pull-off removal with respect to a container having a top opening with an annular top seal finish, said composite closure comprising an outer integrally-formed plastic fitment and a gasketed closure lid carried within said fitment, said fitment having a top portion which includes an outer annular section and an inner lift tab, and a generally cylindrical skirt portion depending from the periphery of said outer annular section, said depending skirt having a plurality of lid-engaging lugs extending radially inwardly therefrom positioned to engage and retain the periphery of said gasketed closure lid, said inner lift tab being hinged to said annular section at a portion thereof which has a smaller radius than the radius to said lugs, and being hinged at a portion thereof which is axially aligned with a radius of one of said lugs.

3,907,159

DISPENSING DEVICE

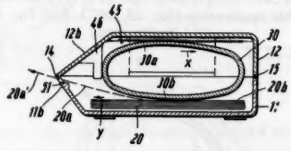
Hans Halm, Herne, Germany, assignor to Arlac-Werk Heiko Ippen, Hamburg, Germany

Filed Mar. 20, 1974, Ser. No. 453,090

Claims priority, application Germany, Mar. 21, 1973, 2314049

Int. Cl.[2] B65G *59/02*

U.S. Cl. 221—23 **8 Claims**



1. A dispensing device for dispensing memo sheets or the like, comprising of a two-part housing of a lower housing member and an upper housing member defining together a dispensing slot at a front end of the housing, a stack of sheets adapted to be inserted into said housing, and an endless conveyor means adapted to act upon a stack of memo sheets inserted into said housing, said dispensing device characterized by an annular body floating freely within the interior cavity of said housing, said housing being closed on all sides except for said front end dispensing slot, said annular body engaging with an upper portion the inner surface of the upper housing member top wall, and engaging with a lower portion an uppermost sheet of a stack of memo sheets inserted into said lower housing member, said annular body consisting of a continuous strip of spring steel coated at its outer periphery with a central ribbon-like friction-increasing coating, and adapted to assume a substantially elliptic configuration with substantially arcuate engagement surface portions, in automatically adjusting itself to the spacing between the uppermost memo sheet and the inner surface of said top wall upper housing member, in thereby maintaining an approximately even contact pressure, said annular body furthermore being guided by a mounting provided within said housing cavity, and being in engagement with a pair of profiled bar-type slide surfaces integral with the inner surface of said upper housing member top wall, each of said guide surfaces being extended, at the end facing the dispensing slot, by a vertical stop extending transversely of the longitudinal axis of said annular body to a point located below a horizontal plane through the center of said annular body.

3,907,160

APPARATUS FOR DISPENSING ARTICLES SUCH AS NEWSPAPERS AND THE LIKE

Harry O. Moore, Charlotte, N.C., assignor to Chris Combis, Charlotte, N.C., a part interest

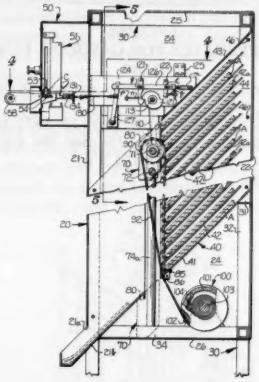
Filed Mar. 8, 1974, Ser. No. 449,385

Int. Cl.[2] G07F *11/00*

U.S. Cl. 221—84 **13 Claims**

1. Apparatus for dispensing articles, such as newspapers, magazines and the like, comprising means for supporting a stack of articles for gravitational sliding movement therefrom, pliable means having one end anchored adjacent said supporting means and the last articles of the stack to be dispensed and having a portion extending alongside said supporting means adapted to engage and extend across corresponding forward edges of the articles in the stack to restrain the same from forward sliding movement from the stack, rotatable means engaging said pliable means and normally being positioned adjacent the next article to be dispensed from the stack and mounted for substantially linear movement toward said one anchored end of said pliable means and alonside said supporting means and adjacent the forward edges of the articles in the stack, and means for effecting said linear movement to said

rotatable means in an incremental manner while rotating said rotatable means to cause the pliable means engaged thereby to have its portion extending alonside said supporting means



to be foreshortened and to effect dispensing of the thus unrestrained article in the stack without disturbing the remaining portion of the pliable means engaging the remaining articles to be dispensed

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3,907,161

APPARATUS FOR DENESTING STACKED PACKAGING TRAYS

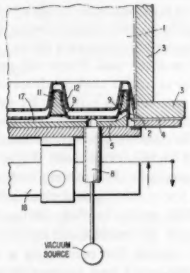
Eberhard Martin, Wehrda near Marburg, Germany, assignor to Dr. Ing. Kaupert KG, Erndtebruck, Westphalia, Germany

Filed Nov. 27, 1973, Ser. No. 419,295

Claims priority, application Germany, Nov. 27, 1972, 2258055

Int. Cl. B23q *7/04*

U.S. Cl. 221—211 **6 Claims**



1. In an apparatus for denesting thin-walled packaging trays each having at least one cup-shaped depression defined by side and base walls of the tray and a peripheral wall extending from the height of the top of the depressions down to approximately the height of the base walls, the apparatus being of the type that has a magazine accommodating the trays in a nested stack, the magazine has an outlet opening through which the outermost tray of the stack is adapted to be removed in a direction of removal, and a retaining means projecting into the outlet opening of the magazine for supporting the nested stack by engaging the outermost tray, the apparatus further includes a suction gripper orientable towards the magazine opening and movable into an operative position to grasp the outermost tray by means of vacuum, the suction gripper having a gripper head including means defining at least one cavity for nestingly accommodating the walls of the depression of the outermost tray when said suction gripper is brought into the operative position, the improvement comprising:

a. abutments supported by the magazine and arranged approximately centrally thereof, said abutments constituting said retaining means;

b. a peripheral web forming part of said gripper head and having an outwardly concave outer surface disposed to adjoin the peripheral wall of the outermost tray when said suction gripper is brought into its operative position, said outer surface being concave about a line substantially parallel to said direction of removal; and

c. means for generating a vacuum between said outer surface of said peripheral web and the adjoining peripheral wall of the outermost tray when said suction gripper is in its operative position for drawing the peripheral wall of the outermost tray into said concave outer surface of said peripheral web to disengage edge portions of the peripheral wall of the outermost tray from said abutments.

3,907,162

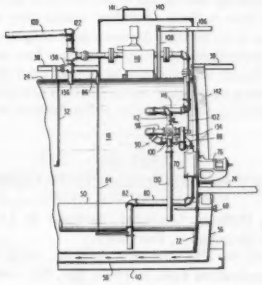
THERMOPLASTIC MATERIAL CONVEYANCE AND HANDLING PROCESS

Steven K. Maxfield, 3807 W. Lower Buckeye Rd., Phoenix, Ariz. 85007

Continuation-in-part of Ser. No. 59,208, July 29, 1970, abandoned. This application Feb. 21, 1973, Ser. No. 334,432

Int. Cl.² B67D *5/22*

U.S. Cl. 222—1 **22 Claims**



1. Thermoplastic material conveyance structure, comprising

a base,

means mounting the base for ground-traversing movement,

means including insulated walls defining a reservoir carried by the base for holding thermoplastic material,

heat-generating means carried by the base,

first heat transfer means for transferring heat from the heat-generating means to thermoplastic material in the reservoir,

dispensing means for dispensing molten thermoplastic material from the reservoir,

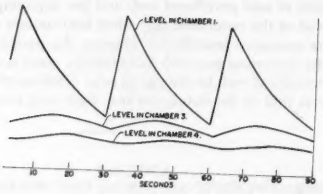
the dispensing means including meter means for measuring the amount of molten thermoplastic material dispensed from the reservoir, and

second heat transfer means for transferring heat from the heat-generating means to the meter means to prevent hardening of thermoplastic material in the meter means.

3,907,163
METHOD OF DISPENSING LOW VELOCITY LIQUID MATERIAL

Charles Christian Gerding, Pittsburgh, and Louis John Todora, Aliquippa, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 324,700, Jan. 18, 1973, Pat. No. 3,831,659. This application May 16, 1974, Ser. No. 470,510
Int. Cl.[2] B22D *37/00*
U.S. Cl. 222—1 **4 Claims**



1. A method of dispensing liquid material at a low velocity, comprising:

a. feeding said liquid material in a pulsating manner into an initial chamber in a constant a multichambered container;

b. flowing said liquid material from said initial chamber into an intermediate chamber under the influence of gravity so as to dampen pulsations in the height of the liquid material which were created in said initial chamber;

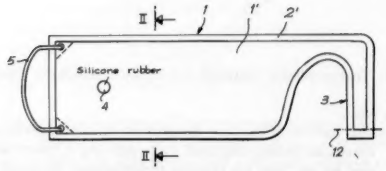
c. further flowing said liquid material from an intermediate chamber into a final chamber under the influence of gravity so as to further dampen said height of the liquid material pulsations, thereby creating a low and relatively constant liquid material height in said final chamber; and

d. dispensing said liquid material from said final chamber of low velocity stream under the influence of gravity.

3,907,164
CONTAINER FOR STORING AND TRANSPORTING SMALL GAS VOLUMES

Walter Stich, Hollern, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Continuation of Ser. No. 284,400, Aug. 28, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,351
Int. Cl.[2] B67B *7/24*
U.S. Cl. 222—3 **5 Claims**

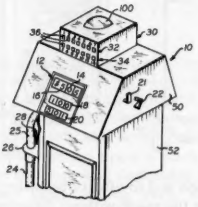


1. A container for a small volume of a gaseous fluid releasably stored therein under low pressure, comprising a flattenable body of generally rectangular outline with two coextensive walls joined together along their edges in a fluidtight manner, said walls being cut away along part of a first major edge of the rectangle in the vicinity of a minor edge thereof with formation of a constricted neck along a second major edge opposite the cut-away part of said first edge and a reduced spout adjoining said neck, said spout extending along said minor edge and terminating at said first major edge in a frangible sealed end, said spout being temporarily resealable upon fracture of the seal thereof by folding back upon itself along said minor edge, and a patch of self-sealing plastic material adhering to a limited area of one of its walls at a location separated from said spout by said neck.

3,907,165
CONTROL APPARATUS FOR GASOLINE DISPENSING PUMP

Theodore Carbone, Hawthorne, N.J., assignor to Process Controls, Clifton, N.J.

Continuation of Ser. No. 291,782, Sept. 25, 1972, abandoned. This application Feb. 26, 1974, Ser. No. 446,015
Int. Cl. B67d *5/10*
U.S. Cl. 222—16 **4 Claims**



1. A control apparatus for use with gasoline dispensing equipment which equipment includes a computer counter of the indicating type rotatable in synchronism with the flow of gasoline through said equipment, said counter having at least one rotatable wheel with a plurality of projecting teeth positioned along the periphery thereof, said control apparatus consisting of a housing, an elongated finger projecting outwardly from said housing and being directly positioned in the area between two adjacent teeth on said rotatable wheel of said counter by passing through a small opening in the housing enclosing said counter and into said area between adjacent teeth and to engage sequentially and individually successive teeth of said plurality of teeth on said wheel when said counter moves to positions equivalent to predetermined volume levels of dispensed gasoline, said finger being unattached to said counter, and said control apparatus having no associated parts attached to said counter, said finger assuming a first position when said counter is not at said predetermined volume levels and being urged to a second position by said wheel when said counter is at said volume levels, a first electrical switch connected to said extended finger and actuated thereby to transmit an electrical signal when said finger is in said second position, sensing means operatively connected to said first electrical switch for receiving said electrical signal and assuming an operational mode corresponding to the amount of gasoline dispensed as measured by the position of said counter; control means for presetting a specific volume of gasoline to be dispensed and cooperating with said sensing means when said counter mechanism is moved to a position corresponding to the preset volume of gasoline; and second switch means operatively connected to said sensing means and effective to interrupt the flow of gasoline through said dispensing equipment when said sensing means and said control means cooperate thereby stopping the flow of gasoline from said pump at said preset value.

3,907,166
MATERIAL MEASURING AND DISPENSING DEVICE

Anthony L. Bassignani, 17 King St., Norfolk, Mass. 02056

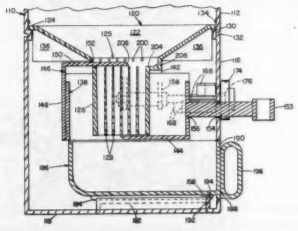
Filed May 3, 1974, Ser. No. 466,732
Int. Cl.[2] B67D *5/22*; **G01F** *11/18*
U.S. Cl. 222—42 **11 Claims**

2. A device for measuring and dispensing granular material which comprises:

a container for the material having a material discharge outlet opening at the bottom thereof;

dispensing means including a plurality of closely adjacent material receiving compartments open at top and bottom, a barrier member for shielding the tops of said compartments from said outlet opening at one position relative to said compartments, and a closure member for closing the bottoms of said compartments at one position relative to said compartments;

means fixedly mounting said compartments at said outlet opening and mounting said members for reciprocation across the tops and bottoms respectively of said compartments between a single fill position in which all of said compartments are exposed at their tops to said outlet opening and are closed at their bottoms by said bottom closure member, and a plurality of dispense positions in



which selected different numbers of said compartments have the tops thereof shielded from said outlet opening by said barrier member and the bottoms thereof exposed for dispensing;

dispense operating means accessible from the exterior of the device for reciprocating said members;

control means adjustable to stop the movement of said members by said dispense operating means at selected dispense positions corresponding to said selected numbers;

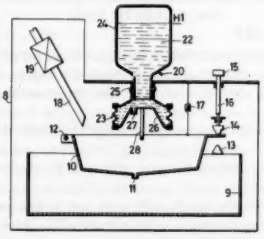
and adjustment means for said control means accessible from the exterior of the device and operable to set said control means to stop said movement at said selected positions, including indicator means showing the compartment capacity to be dispensed at each setting of said adjustment means.

3,907,167

APPARATUS FOR DISPENSING AND MIXING LIQUID SUBSTANCES IN METERED VOLUMES

Giacinto Zanardo, Pordenone, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy

Filed Sept. 20, 1974, Ser. No. 507,971
Int. Cl. B67d *5/56*
U.S. Cl. 222—57 **12 Claims**



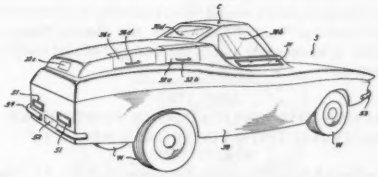
1. An apparatus for dispensing and blending liquid substances in metered quantities, comprising in a housing a duct for feeding-in a predetermined amount of a first liquid in a foraminous-bottom tray swingable between a first position corresponding to an empty condition and a second position corresponding to conditions of substantial filling with said first liquid, the perforation through said bottom wall having an output less than that of said duct, a hermetically sealed container, arranged above said tray, for a second liquid to be admixed with the first, and a blending tank adapted to receive the liquids issuing from said hole, characterized in that at least one portion of said hermetically sealed container is elastically deformable between an expanded position and a compressed position, and vice versa, said portion being equipped with at least an opening on the bottom wall and being mechanically connected in a linkable manner to said tray, so that when the latter is switched from said first to said second position the deformable portion of the container is in an expanded position, so that through said opening a certain volume of atmospherical air enters said container and when the tray is switched in the reverse direction, the deformable portion of the container is under compression conditions, so that through said opening there emerges and drops in said tray a volume of said second liquid which is equal to said volume of air.

3,907,168

MOBILE STATION FOR DELIVERY OF PETROLEUM PRODUCTS

Delles T. Davis, and Bruce D. Motlong, both of Abilene, Tex., assignors to Development Research, Ltd.

Filed Feb. 8, 1971, Ser. No. 113,493
Int. Cl. B67d *5/04*
U.S. Cl. 222—76 **1 Claim**



1. A mobile petroleum supply station for delivery of petroleum products and associated filling station products and services directly to vehicles of customers, comprising:

a. motor means providing power to move the station to selected locations to deliver the petroleum products to the vehicles of the customers;

b. storage means for containing the petroleum products to be delivered;

c. pumping means for conveying the petroleum products to the vehicles of the customers;

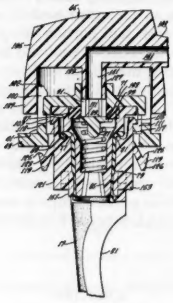
d. safety means for de-energizing said pumping means when said motor means is operating wherein the risk of injury or damage during delivery of the petroleum products is reduced; and

e. said safety means further including means for de-energizing said pumping means until said supply station is electrically grounded to the customer's vehicle whereby the risk of electrical sparks producing a fire is reduced.

3,907,169
BLADDER TYPE DISPENSER

Norman Gortz, 11151 Coventry Pl., Santa Ana, Calif. 92705, and Michael B. Maccarone, 17932 Gillman Ave., Irvine, Calif. 92664

Division of Ser. No. 86,506, Nov. 3, 1970, Pat. No. 3,767,078.
This application Sept. 10, 1973, Ser. No. 395,938
Int. Cl.[2] B65D *25/14*
U.S. Cl. 222—95 **27 Claims**



1. A pressurized apparatus comprising:

a. an elongated resilient bladder having wall means defining a fluid chamber interior of the bladder and a fluid outlet in communication with the interior of the bladder;

b. an elongate surface exterior of the bladder against which said bladder is stretched longitudinally so as to maintain the bladder wall means in tension and the bladder substantially empty in the contracted position, said elongate surface being longitudinally convex and formed by a rigid, generally spatulate member; and

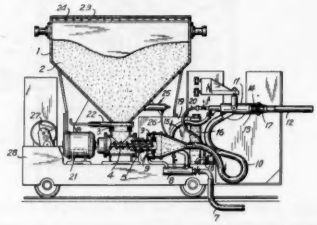
c. a valve assembly, said spatulate member being anchored at one of its ends in said valve assembly, the fluid outlet of said bladder being located at one end of said bladder and being anchored in said valve assembly so as to receive and discharge fluid therethrough, the bladder being attached at its opposite end ot the free end of said spatulate member.

3,907,170
MACHINE FOR APPLICATION OF POWDERLIKE MATERIAL ONTO LINING OR SURFACE OF STRUCTURE

Ivan Vasilievich Schedrin, ulitsa Lomonosova, I, kv. 22; Vladimir Ilich Shakhlin, ulitsa Lenina, 60/I, kv. 51, both of Magnitogorsk, U.S.S.R.; Anatoly Samuilovich Freidenberg, ulitsa Malysheva, III, kv. 57, Sverdlovsk, U.S.S.R.; Gennady Elizarovich Ovchinnikov, ulitsa Kalinina, 3, kv. 85, Magnitogorsk, U.S.S.R.; Alexei Grigorievich Trifonov, ulitsa Pushkina, 30, kv. 14, Magnitogorsk; Fedor Timofeevich Melnikov, ulitsa Stroitelei, 6, kv. 12, Magnitogorsk, U.S.S.R.; Andrei Dmitrievich Filatov, ulitsa Oktyabrskaya, 15, kv. 7, Magnitogorsk, U.S.S.R.; Vladimir Fedorovich Gazhur, ulitsa Lomonosova, 6, kv. 24, Magnitogorsk, U.S.S.R.; Timofei Grigorievich Shunin, poselok Dzerhinskogo, ulitsa Dzhambula, 16, Magnitogorsk, U.S.S.R.; Mikhail Moiseevich Privalov, Bolshaya Dekabrskaya ulitsa, 3, korpus 14, kv. 49, Moscow, U.S.S.R.; Anatoly Ivanovich Konovalov, ulitsa Lenina, 5, kv. 47, Sverdlovsk, U.S.S.R.; Andrei Lvovich Garyaev, deceased, late of Moscow, U.S.S.R.; by Nina Andreevna Garyaev, administrator, and by Marina Andreevna Garyaeva, administrator, both of ulitsa Lizy Chaikinoi, 6, kv. 46, Moscow, U.S.S.R.

Continuation of Ser. No. 65,483, Aug. 20, 1970, abandoned.
This application July 9, 1973, Ser. No. 377,779
Int. Cl. B05b *7/04, 7/06*
U.S. Cl. 222—135 **5 Claims**

1. A machine for the application of powderlike material onto the lining or surfaces of a structure, comprising: a hopper for powderlike material; a screw feeder arranged below said hopper and having an outlet; an outlet chamber coaxially arranged at the outlet of said feeder and constituting a jet pump in which the medium being pumped is the powderlike material supplied from said screw feeder and the conveying medium is compressed air; means for feeding compressed air to said jet pump, nozzles in said outlet chamber, said nozzles being connected to the means which feeds compressed air, said outlet chamber having a longitudinal axis in the direction of which said powderlike material is supplied, said nozzles being arranged at an acute angle with respect to said longitudinal axis; a manipulator shaft; said manipulator shaft having a receiver chamber with a longitudinal axis, means connecting said receiver chamber to said outlet chamber, said receiver chamber of the manipulator shaft being constituted as a jet



pump in which the medium being pumped is the powderlike material supplied from said outlet chamber of the feeder and the conveying medium is compressed air; means for feeding compressed air to the receiver chamber of the manipulator shaft as said conveying medium and comprising a straight tubular conduit mounted within the receiver chamber of the manipulator shaft and extending along the axis of said receiver chamber to the rear end thereof, and an inlet for compressed air at the rear end of said tubular conduit, the powderlike material supplied from the outlet chamber of the feeder flowing around said straight conduit for the compressed air, a second tubular conduit coaxially mounted within the first tubular conduit and extending therealong to the rear end of the receiver chamber, and means at said rear end of the tubular conduit for feeding to said second conduit a fluid serving as a moistening and additional conveying medium for said powderlike material.

3,907,171
CONTAINER WITH SLIP-ON CAP RETAINING MEANS

William S. Pearson, Hampstead, Md., assignor to Cypro Incorporated, Hampstead, Md.

Filed Dec. 19, 1973, Ser. No. 426,234
Int. Cl.[2] B67B *3/02*
U.S. Cl. 222—182 **6 Claims**

1. In a bottle-type container having a body topped by a neck of substantially smaller diameter than the body and adapted for receiving a container closure, the improvement comprising:

an annular collar of substantial length between the body and the neck;

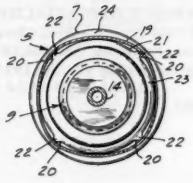
stop shoulder means located adjacent to the body end of said collar;

an overcap within which said neck and collar are received, said overcap having a resiliently flexible skirt which is of an undistorted inside diameter greater than the principal diameter of said collar;

a plurality of substantially circumferentially spaced diametrically opposite prominent outward protrusions on said

collar extending to a greater diameter than the undistorted inside diameter of said skirt; and

circumferentially arcuate areas of substantial width on said collar intermediate said protrusions and lying on a common diameter which is less than said undistorted inside diameter of said skirt;



whereby said skirt receives said collar in press-on engagement wherein areas of the skirt directly engaged by said protrusions are stretched radially outwardly and effect corresponding radially inward deflection of the areas of the skirt intermediate the protrusions into frictional retaining engagement with said arcuate areas, so that there is dual frictional retention of the skirt to hold the overcap in place on the container.

3,907,172

CONTAINER SPOUTS AND STRAINERS

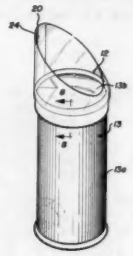
Gary Martin Curtis, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 8, 1974, Ser. No. 495,775

Int. Cl.² B65D *25/42*

U.S. Cl. 222—189 **21 Claims**

1. A container and pour spout structure comprising a container body adapted to be opened at one end thereof, a tubular flexible sheet material pour spout member about and substantially in contact at opposite ends thereof with said body, said flexible sheet material member having a first margin continuously encircling and tightly engaging and fixed with respect to said body adjacent said one end of the body and a second margin spaced substantially away from said one body end toward an opposite end of said body, said first margin having a continuous inner surface in sealing contact with said container body around its circumference and provided in its entirety by a single surface portion of said tubular member, said flexible sheet material member being manually manipulatable by peeling said second margin back over and past said first margin and beyond said one end of the body so that the sheet material member is turned inside-out and provides said



pour spout, said first margin remains fixed adjacent said one end of the container body during said peeling back of said second margin.

3,907,173

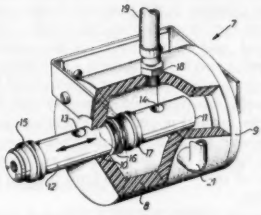
METERING DEVICE

John Henric Lind, Solna, Sweden, assignor to Polypur Forsaljnings AB, Sundbyberg, Sweden

Filed Jan. 28, 1974, Ser. No. 437,521

Int. Cl.² G01F *11/10;* **G05D** *11/02*

U.S. Cl. 222—330 **5 Claims**

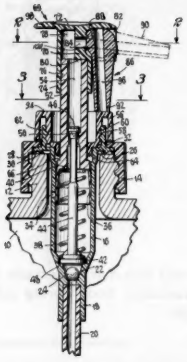


1. A metering device for alternatingly charging a predetermined quantity of fluid to a container, which preferably forms part of a water purification system, said device comprising a housing having two opposed walls having openings disposed therein; means for supplying the fluid to be metered to said housing to keep the housing at least partially filled with said fluid; an elongated slide arranged in fluid-tight relation in said opening in said housing walls for reciprocating movement relative to the housing between two limiting positions, said slide having a transverse cross-section substantially less than that of the interior of the housing and being provided with at least two separate, non-communicating recesses, said recesses being spaced such a distance apart that reciprocation of the slide between said two limiting positions alternately moves said recesses between a position within the interior of the housing at which the recess is filled with fluid to a position externally of the housing at which the recess empties fluid therein into said container; and means for reciprocating said slide between said positions.

3,907,174
DISPENSING PUMP CONSTRUCTION WITH FOLDABLE DISCHARGE NOZZLE

Wolf Steiman, Fairfield, Conn., assignor to VCA Corporation, Baton Rouge, La.

Filed Apr. 13, 1971, Ser. No. 133,508
Int. Cl.[2] B67D *5/42*
U.S. Cl. 222—383 **5 Claims**



1. A dispensing-pump actuator construction for hand-held dispensers comprising, in combination:

a. a pump cylinder having internal screw threads, and having means for vertically mounting the cylinder on a container neck,

b. a piston vertically reciprocatable in the cylinder,

c. an upstanding hollow piston rod connected to the piston to actuate the same and to conduct liquid product upward from the cylinder as the piston is reciprocated,

d. a depress button carried on the upper extremity of the piston rod, said button having a thin-walled depending skirt portion and having therein a concentric, centralized lower bore in which the upper extremity of the piston rod is frictionally received, said button further having an eccentrically located upper bore communicating with said hollow piston rod and with said lower bore and forming with the latter a stop shoulder for engagement with the top edge of the piston rod to limit the rod insertion into the button,

e. said depress button having a rounded socket disposed laterally of said upper bore, and having a communicating passage connecting the socket and upper bore, and

f. a pivotal nozzle piece provided with a bulbous enlargement at one end, said enlargement being received in and frictionally seized by the said socket, the other end of the nozzle piece being open for the discharge of product therefrom,

g. the nozzle piece being swingable and foldable between a horizontal position for discharging product from the button and a downturned folded vertical position for shutting off said discharge,

h. a collar constituted as an annulus having external screw threads engageable with the screw threads of the cylinder, said collar being rigid with the cylinder and surrounding the piston rod, the other end of the nozzle piece being engageable with said collar when the piece is folded downward to its vertical position, thereby to intercept and stop flow of liquid product from the nozzle piece when folded,

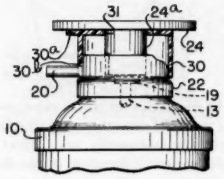
i. said collar having an expansive top surface sealingly engaging and closing off the open end of the nozzle piece when the latter is in the folded vertical position, whereby any remaining liquid product contained therein is closed off from the atmosphere to prevent drying out and hardening thereof,

j. said nozzle piece when folded downward being juxtaposed to and engageable with the thin-walled skift of the depress button and constituting therewith a compact assemblage disposed substantially wholly within theoretical upward extensions of the peripheral wall of said collar.

3,907,175
AEROSOL CAN ATTACHMENT

Edwin J. Haas, 17004 Pearldale Ave., Cleveland, Ohio 44135

Continuation-in-part of Ser. No. 406,257, Oct. 15, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,197
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.13 **1 Claim**

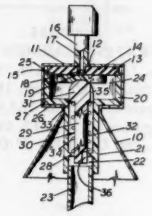


1. An aerosol dispenser attachment for use with a cylindrical pressurized tubular can having a top and a bottom and an elongated body connected between them in an air-tight manner and with a control valve structure fixed in said can and having a contents inlet tube extending therefrom to a zone adjacent the bottom of said can and having an outlet tube extending axially of said can in an air-tight manner through the top of said can, said outlet tube having an operative connection with said control valve structure such that pressure on said outlet tube releases pressurized contents from said can through said valve and outlet tube; the combination therewith of a generally cylindrical collar fixed in said can and extending from the top of said can upwardly slightly above the level of said outlet tube, a bore through said outlet tube communicating with said control valve when the latter is open, said bore turning radially outwardly in the zone of said collar, an integral discharge spout on said collar aligned with said out-turned bore, an integral hollow connector between said spout and said out-turned bore sufficiently flexible to permit movement of said outlet tube sufficient to open said control valve, an attachment comprising a circular disk of lesser diameter than said can and a downwardly extending hollow cylindrical projection concentric with said disk, the hollow of said projection of a diameter snugly fitting said outlet tube cap, whereby pressure on said disk in any radial direction causes depression of said outlet tube sufficient to open said control valve, a connection in the hollow of said projection between said disk and said outlet tube, said connection between said disk and said outlet tube comprises a compression spring and a contactor in the hollow of said projection engaging said outlet tube cap, a closure cap snugly fitting over said collar and having a central through opening snugly receiving said hollow cylindrical projection passing through it, and said closure cap being proportioned by its height to prevent actuation of said outlet tube cap by pressure on said disk until said closure cap is removed.

3,907,176
METERING VALVE FOR AEROSOL DISPENSER

Arthur M. Harris, 135 Southwood Rd., Fairfield, Conn. 06430

Continuation of Ser. No. 69,249, Sept. 3, 1970. This application Oct. 11, 1972, Ser. No. 296,514
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.22 12 Claims

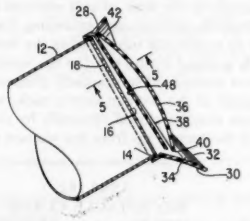


1. A metering valve assembly for pressurized aerosol dispensers having, within a valve housing, a pair of valves, one controlling access from the valve housing to the bore of an exteriorly extending valve stem and the other controlling access of the pressurized contents of the dispenser from the interior of the latter to the valve housing; means resiliently urging the first valve to closed position and the second valve to open position; and means responsive to lateral pressure upon the exteriorly extending portion of said valve stem to tilt the latter relative to its axis, first to move the second of said valves to closed position and thereafter to move the first of said valves to open position, said resiliently urging means returning the valves to their original condition in the reverse order when said lateral pressure ceases.

3,907,177
SELF-CLOSING CAP FOR CONTAINERS SUCH AS CANS AND THE LIKE

Myron M. Levin, Highland Park, Ill., assignor to E-Z Por Corporation, Niles, Ill.

Filed June 27, 1974, Ser. No. 483,682
Int. Cl.² B65D *47/08*
U.S. Cl. 222—500 8 Claims

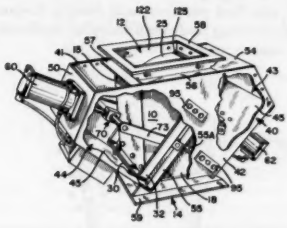


1. A self-closing container cap consisting of a cap body and a disk valve and in which the cap body has an annular lower wall or band or skirt forming the lower portion of said cap body, the inside wall thereof having inwardly facing spaced circumferential ribs, with the upper rib of triangular shape in cross-section, said spaced ribs adapted to receive therebetween the top rim of the container, whereby the cap body is detachably secured to the container, an upper wall extending upwardly of the annular lower wall, said upper wall having a spout at the front thereof, a dome-shaped top wall connected to said cap body and provided with an opening adjacent said spout, a disk valve floatingly positioned in said cap body below said dome-shaped top and above the upper rib and having a beveled peripheral edge to correspond to the top surface of said upper rib so that it seats thereon.

3,907,178
ENCLOSED LOCK GATE VALVE

George W. Armstrong, P.O. Box 507, Fairborn, Ohio 45324

Filed Nov. 4, 1974, Ser. No. 520,625
Int. Cl.² B65G *65/62*
U.S. Cl. 222—504 13 Claims



7. An improved lock gate valve comprising an inner housing means defining an axially elongated section of generally rectangular conduit extending between an inlet and an outlet, an outer housing having generally flat side walls spaced from said conduit and transverse end walls, said outer housing substantially surrounding and enclosing said inner housing means having blade receiving offset portions formed at opposite sides of said inner housing, divider means between said side walls and said inner housing isolating said offset portions from each other, means in said inner housing defining a first blade slot adjacent said inlet proportioned to receive a first curved flow control blade therethrough and defining a second blade receiving slot adjacent said outlet to receive a second curved flow control blade therethrough, a first curved flow control blade extending through said first slot adjacent said inlet with the concave side thereof facing said outlet, support arms pivotally mounted on said side walls and supporting said first blade for pivotal movement between a closed position extending across said inlet and a retracted position in which a substantial portion of said first blade is received in one of said offset portions, a second curved flow control blade extending through said second slot adjacent said outlet with the concave side thereof facing said inlet, support arms pivoted on said walls and supporting said second blade for movement between a closed position extending across said outlet and a retracted position in which a substantial portion of said blade extends into said outer housing portion, and blade seal means between said inner housing means and said blades in the closed position thereof for sealing said blades in said closed position at the walls of said inner housing means.

3,907,179
ONE PIECE MOLDED DISPENSING SPOUT CAP

Harold T. Pehr, Overland Park, Kans., and Paul Gernhardt, Raytown, Mo., assignors to Harold T. Pehr, Overland Park, Kans.

Filed Jan. 21, 1974, Ser. No. 434,860
Int. Cl.² B67D *3/00*
U.S. Cl. 222—513 7 Claims

1. A dispensing container comprising:
   a. a plurality of walls forming a hollow container body at least one of said walls being flexible;
   b. a spout member having a through dispensing opening and being integral with said flexible wall and moveable between first and second positions wherein said flexible wall flexes to permit the movement of said spout member;
   c. resilient means cooperating with said spout member for biasing same to move from said second position to said first position with said first position being a discharge position;
   d. a retaining member selectively cooperating with said spout member adjacent a free end thereof for releasably retaining said spout member in said second position;

e. seal means on said retaining member and engaging said spout member when same is in said second position for sealing said dispensing opening;

f. said resilient means includes an increased thickness portion integral with said flexible wall and connected to said spout member providing a biasing torque to said spout member for urging same to move from said second position to said first position, said biasing torque being induced by moving said spout member from said first position to said second position;

g. said increased thickness portion dividing said flexible wall into a plurality of portions wherein said spout member overlies a portion of one of said wall portions when in said second position;

h. a gusset member integral with and extending between said spout member and said flexible wall and urging said one wall portion to project inwardly of said container when said spout member is in said second position.

3,907,180

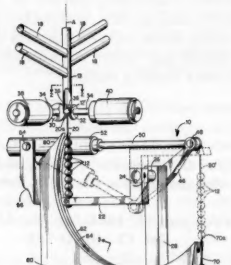
BEAD ORIENTING APPARATUS

John R. Birk, 8 Spruce Ct., Peace Dale, R.I. 02879; Robert B. Kelley, 69 Linden Dr., Kingston, R.I. 02881, and David A. Seres, RFD 1, Box 120A, Sauderstown, R.I. 02874

Filed June 3, 1974, Ser. No. 475,835

Int. Cl. A41n *43/00*

U.S. Cl. 223—48 **11 Claims**



1. Apparatus for orienting bodies of the type which have at least one hole therein, said apparatus comprising: guide means for receiving the bodies and for guiding the same along a path to one end of said guide means; orienting pin means at the said one end of said guide means, said orienting pin means being positioned to contact a body at the said one end of said guide means; and means for imparting motion to a body located at the said one end of said guide means, the said means including a pair of wheels rotatable about non-parallel axes, the peripheries of said wheels being positioned to contact the surface of a body located at the said one end of said guide means, the aforesaid motion being operative to locate the hole of the body relative to said orienting pin means to thereby allow the body to be inserted on said orienting pin means.

3,907,181

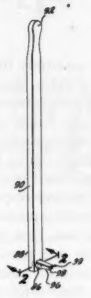
MEANS FOR OPERATING GARMENT SLIDE FASTENER

Edward E. Thomas, 158 Donner Ave., Ventura, Calif. 93003

Division of Ser. No. 325,023, Jan. 19, 1973, which is a continuation-in-part of Ser. No. 165,994, July 26, 1971, abandoned. This application Apr. 12, 1974, Ser. No. 460,283

Int. Cl.² A47J *51/06*

U.S. Cl. 223—111 **2 Claims**



1. Means for operating a slide fastener located on the back of a woman's garment when said garment is worn by a woman, said means comprising:

A. An elongated noselike element, said element having a base at one end and at its other end a smooth, blunt tip, said tip being orificed substantially axially of said element to receive and hold a zipper pull-tab against removal from said orifice by a force applied in any other direction than one in the axis of the orifice; and

B. An elongated handle, said handle being attached at one of its ends to the base of said element substantially perpendicularly thereto, and extending for a sufficient distance to enable the other end of the handle to be conveniently grasped by the hand of the woman user when the element is disposed substantially perpendicular to, and in the small of the woman user's back, whereby the slide fastener may be closed upwardly by raising the grapsed end of the handle up from the women user's shoulder.

3,907,182

RECEPTACLE CLAMP

Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344

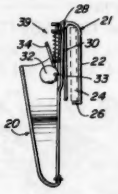
Filed May 3, 1973, Ser. No. 356,804

Int. Cl.² F41B *13/04*

U.S. Cl. 224—2 B **4 Claims**

1. A holster clamp combination for removably securing a holster on a strap, comprising a holster, a substantially U-shaped frame secured to said holster, said U-shaped frame defining an aperture therein constructed to receive a strap, a belt stop member secured to one wall of said U-shaped frame projecting away from said wall into said aperture, a spring arm pivotally mounted on said U-shaped frame, cam means rotably mounted to said U-shaped frame, said cam means comprising a substantially rounded cam body defining a rounded outer surface with a part of the surface forming a ratchet configuration and a cam lever secured to said cam body said cam lever being adapted to rotate said cam body through said frame

aperture against said spring arm to drive said spring arm toward a wall of said frame to engage a strap positioned in said frame, and releasable locking means mounted to said frame, said releasable locking means comprising at least one guide



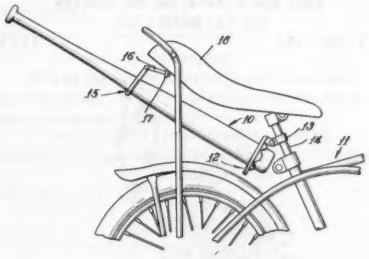
member defining a groove, a locking pin slidably mounted in said guide member groove and spring means connected to said locking pin to bias said locking pin into engagement with said cam and being adapted to hold said cam means in a locked position against said spring arm.

3,907,183

BICYCLE-MOUNTED BASEBALL BAT AND BALL CARRIER

David Shearer, Sr., 131 Maplehurst Blvd., and David Shearer, 30 Eaton St., both of Battle Creek, Mich. 49017

Filed Aug. 9, 1973, Ser. No. 387,180
Int. Cl.[2] B62J *11/00*
U.S. Cl. 224—32 **9 Claims**



1. A baseball bat carrier for mounting on a bicycle, comprising:

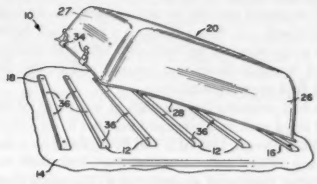
1. a primary supporting member for engaging one end of the baseball bat having:
   a. means defining a peripheral frame, comprising a pair of superposed separate annular flanges,
   b. a sheet of an elastomeric material supported at its periphery by said frame, having a central aperture adapted to engage and retain one end of said bat, the size of the aperture being smaller than the end of the bat to be retained, the periphery of said elastomeric sheet disposed between said flanges and means clamping said flanges together to retain the periphery of said elastomeric sheet therebetween, and
   c. a bracket affixed to said frame and adapted to be mounted on said bicycle, and
2. a secondary supporting member adapted to support the other end of the bat, and means for mounting said secondary supporting member on said bicycle.

3,907,184

ROOF-TOP CONTAINER

James E. Zane, 13879 Kimberly Dr., Largo, Fla. 33540, and John B. Foster, 225 Greenmeadow, Palo Alto, Calif. 94306

Filed Dec. 19, 1973, Ser. No. 425,993
Int. Cl. B60m *9/04*
U.S. Cl. 224 **10 Claims**



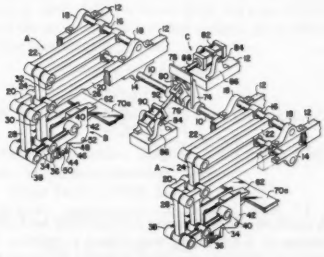
1. A roof-top luggage container device of the type designed to be mounted on the top of automobile type vehicles, said device comprising: support means including a plurality of rub rails fixedly attached to the top of the vehicle; cover means removably attached to said support means and including oppositely disposed side wall portions, said plurality of rub rails comprising at least two outer rub rails disposed substantially adjacent the outer periphery of said plurality of rub rails and in engageable relation with the edge of each of said oppositely disposed side wall portions, attachment means including hinge means secured to one of said two outer rub rails, said hinge means movably interconnected to said correspondingly positioned side wall portion, lock means mounted on the other of said oppositely disposed side wall portions and disposed to lockingly engage the other of said two rub rails relative to the rub rail engaging said attachment means, whereby said cover means is removably supported, at least in part, on said two outer rub rails along said oppositely disposed side wall portions of said cover means.

3,907,185

APPARATUS FOR BREAKING OFF SIDE MARGIN OF WIRE GLASS PLATE

Toshihiro Suzuki, Kurume, Japan, assignor to Central Glass Company, Limited, Ube, Japan

Filed Nov. 22, 1974, Ser. No. 526,461
Claims priority, application Japan, Nov. 27, 1973, 48-132197
Int. Cl.[2] C03B *33/02*
U.S. Cl. 225—97 **8 Claims**



1. Apparatus for breaking off a part of a wire glass plate along a cut line scored thereon, comprising:

first means to grasp the part of the wire glass plate in a predetermined position mounted on a support member;

a first rod arranged parallel to the wire glass plate in said position, an end thereof being pivotally joined with said support member such that said support member is rotat-

able in a plane perpendicular to the wire glass plate in said position;

a second rod pivotally and perpendicularly linked with said first rod at a first distance from said end;

a third rod arranged parallel to said second rod and pivotally linked with said first rod at a second distance longer than said first distance from said end;

a fourth rod pivotally linked with said second and third rods and arranged parallel to and separate from said first rod, said fourth rod being fixed to a first shaft having a fixed axis perpendicular to both said first and second rods at a third distance from said second rod in the direction of said first support member;

a fifth rod pivotally linked with at least one of said second and third rods and arranged parallel to and separate from said fourth rod, said fifth rod being fixed to a second shaft having a fixed axis parallel to said first shaft at said third distance from said second rod in the same direction;

second means to turn one of said first and second shafts on said fixed axis thereof such that said one shaft is subjected to at least one cycle of turns consisting of a first turn through a first angle, a second turn in the reverse direction through a second angle larger than said first angle and a third turn into the initial position thereby to rotate said fourth, fifth and first rods and said first means all in the same direction through movements of said second and third rods along the respective axis thereof; and

third means to hold said support member normally in such a position that the part of the wire glass plate is kept parallel to said first rod and rotate said support member around an axle for joining said first rod therewith when said second turn of said one shaft is completed thereby to exert a pulling force on the wires of the wire glass plate lying across the cut line.

3,907,186

FILM-SPREADER

Robin Hasler, 52 Camper Crescent, Bengeo, Hertford, Hertfordshire, England

Filed July 24, 1972, Ser. No. 274,429

Claims priority, application United Kingdom, Aug. 3, 1971, 36,416/71

Int. Cl. B65h *25/02*

U.S. Cl. 226—7 **13 Claims**

1. A method of maintaining substantially uniform longitudinal tension in a travelling web which comprises feeding the web around a hinged spreading member disposed transversely of the web, said spreading member comprising a body member and a terminal member extending from and hingedly connected to an end of the body member, resiliently biassing at least said terminal member into cooperating engagement with at least a marginal zone of the web, so that the terminal member is capable of adopting varying angular positions relative to the body member to maintain the desired web tension, and withdrawing the web from the spreading member against the biassing influence of the terminal member.

3,907,187

SUCTION DEVICE, ABLE TO STORE YARN, FOR CONTROLLING A SOURCE OF SUPPLY

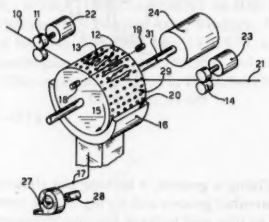
Giampaolo Collausig, Pordenone, Italy, assignor to Officine Savio, S.p.A., Pordenone, Italy

Filed Mar. 18, 1974, Ser. No. 452,392

Claims priority, application Italy, Mar. 16, 1973, 83336/73; Jan. 29, 1974, 83310/74

Int. Cl.² B65H *17/20*

U.S. Cl. 226—42 **8 Claims**



1. Yarn storing suction device comprising yarn supply means, yarn draw-off means, a rotatable suction cylinder positioned between said supply means and said draw-off means to accumulate yarn on the surface thereof, at least one scanning device positioned to register the presence of yarn on said suction device and control the accumulation by producing signals regulating said supply means and draw-off means to keep the accumulation of yarn between two pre-set values.

3,907,188

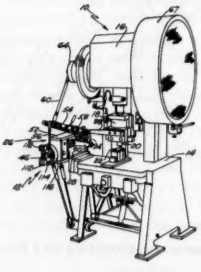
INTERMITTENT STRIP ROLL FEED

Carl G. Peterson, Smithfield, R.I., assignor to Cooper-Weymouth, Peterson, Inc., Westfield, Mass.

Filed Apr. 8, 1974, Ser. No. 459,129

Int. Cl.² B65H *17/22*

U.S. Cl. 226—154 **11 Claims**



1. A roll feed for intermittently feeding strip stock to a power press having a reciprocating ram, comprising a pair of drivingly engaged rollers between which said stock extends, means carried by said press imparting oscillatory movement to said rollers, one of said rollers being movable between a first position wherein said stock is drivingly engaged by said rollers and a second position wherein said stock is disengaged, resilient means normally urging said one roller to said first position, and cam means controlled by movement of said ram for moving said one roller to said second position, said cam means being operable in timed relation to said oscillating means whereby so long as said rollers are rotating in a forward or feed direction, said one roller is in said first position, and so long as said rollers are rotating in a reverse direction, said one roller is in said second position, said one roller being journalled on a pivotally mounted lever, said cam means being

rotatably carried by said lever, link means interconnecting said cam means and said ram whereby reciprocation of the latter imparts oscillatory movement to the former, and a cam follower cooperating with said cam means during oscillation of the latter to cause pivoting of said lever to move said one roller to its aforesaid first and second positions.

3,907,189

YARN FEED MEANS

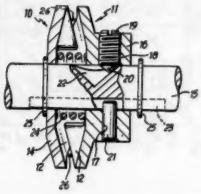
John Dalton Griffith, 59 Havenbaulk Ave., Littleover, Derby, Derbyshire, England

Filed Feb. 8, 1974, Ser. No. 440,773

Claims priority, application United Kingdom, Feb. 9, 1973, 6629/73

Int. Cl.² B65H *17/22*

U.S. Cl. 226—176 **4 Claims**



1. A yarn feed means comprising a rotatable mounting shaft, said shaft having a conical recess in its periphery, a pair of disc like elements mounted on said shaft for rotation therewith, each of said elements having an interrupted conical face whereby the elements can be moved into a position such that one interrupted conical face interengages the other interrupted conical face, a screw means on one element and arranged to pass into said conical recess in said mounting shaft, and spring means between said elements and biasing said elements apart.

3,907,190

STAPLER WITH A PUNCH MECHANISM

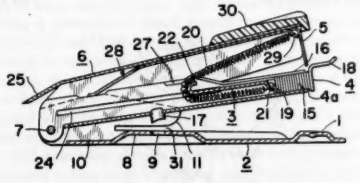
Yoshio Mitsuhashi, 79, Higashi-Kibogaoka, Asahi-ku, Yokohama, Kanagawa, Japan

Filed Feb. 22, 1974, Ser. No. 444,986

Claims priority, application Japan, Feb. 26, 1973, 48-22954

Int. Cl.² B25C *5/16*

U.S. Cl. 227—127 **3 Claims**



1. In a stapler of the type including a base having an anvil die adjacent one end thereof, an open-top staple magazine having a staple dispensing aperture provided in a distal end of a bottom wall thereof, said magazine being pivoted at its proximal end to the other end of said base so as to be turnable up and down relative thereto, a lever having a staple ejector at its distal end and also pivotally connected at its proximal end to the other end of said base so as to be turnable up and down relative thereto, said lever being adapted to drive each foremost staple accommodated within said staple magazine out of said dispensing aperture by said staple ejector such that the dispensed staple is clinched by said anvil die to hold layers of penetrable material together, a feed element slidably mounted within said staple magazine and having a front end facing the staples accommodated therein, and spring means urging said feed element toward said dispensing aperture to feed the staples toward the dispensing aperture:

the improvement wherein said spring means comprises a tension spring connected at one end thereof to said front end of said feed element and at the other end thereof to said distal end of the lever, said tension spring extending from said front end to the rear end of the feed element remote from said front end along the length of the feed element and being substantially folded over said rear end to urge the feed element toward the dispensing aperture in the normal position of the stapler.

3,907,191

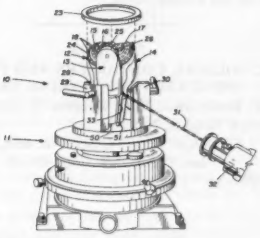
METHOD OF CONSTRUCTING A ROTARY ROCK BIT

Carl Laurent Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 24, 1973, Ser. No. 409,208

Int. Cl.² B23K *15/00, 37/04*

U.S. Cl. 228—182 **8 Claims**



1. A method of constructing a rotary rock bit with an accurate gage size from a multiplicity of individual segments wherein each of the individual segments includes individual parting faces and a gage cutting surface, comprising the steps of:

placing the individual segments adjacent one another with the surfaces of the parting faces of the adjacent segments in abutting relationship to one another,

sliding the individual segments relative to one another thereby causing unrestricted movement of the parting faces of an individual segment against the parting faces of the next adjacent segments over substantially the entire surfaces of said abutting faces until the gage cutting surfaces of the segments are at the desired gage size, and

welding the segments together.

3,907,192

PROCESS FOR THE MANUFACTURE OF A GLAZING UNIT

Joannes Grietens, Kasterlee, Belgium, assignor to Glaverbel-Mecaniver, Watermael-Boitsfort, Belgium

Filed Feb. 6, 1973, Ser. No. 330,097

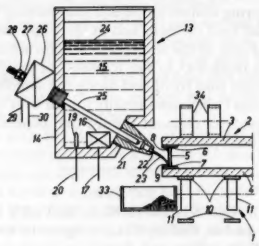
Claims priority, application Luxemburg, Feb. 11, 1972, 64771

Int. Cl.² B23K *31/02, 35/12*

U.S. Cl. 228—256 **6 Claims**

1. In a process for manufacturing a glazing unit by jointing a metallized margin of a sheet of glass to an intervening spacer strip following a course along the peripheral margin of the unit in which the joint between said sheet and said strip along at least a section of such course is formed by applying solder into the corner angle between such sheet and said strip to form a solder bead along said section, the improvement comprising progressively forming said solder bead at least in part by discharging a continuous stream of molten solder directly into

said corner angle from an adjacent orifice while such orifice on the one hand and said strip and sheet on the other hand are relatively displaced substantially parallel with said course section, the position and orientation of said orifice and the



discharge velocity of the solder stream in relation to the position of the sheet and strip defining said corner angle being such as to cause the solder stream to initially impinge against one of the surfaces defining the corner angle and flow toward the vertex of the corner angle.

3,907,193

PLASTIC FOLDING CONTAINERS AND PROCESS AND APPARATUS FOR MAKING SAME

Joel Heller, Greenlawn, N.Y., assignor to Autoplex Corporation, Roslyn Heights, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,838

Int. Cl.[2] B65D *5/00, 43/16*

U.S. Cl. 229—16 **3 Claims**

1. A container comprising walls of plastic sheet material joined to each other by fold lines comprising heat-scored linear indentations on opposite faces of the sheet material, the thickness of the sheet material between the indentations being substantially less than the thickness of the sheet material away from the fold lines, the density of the sheet material between the indentations being substantially greater than the density of the sheet material away from the fold lines, and the quantity of plastic material along each of said fold lines being less than the quantity of material through an equal cross-sectional area of sheet material located away from the fold lines, said fold lines being further characterized by the absence of ridges of laterally displaced plastic material along the heat-scored linear indentations.

3,907,194

POLYGONAL CONTAINER

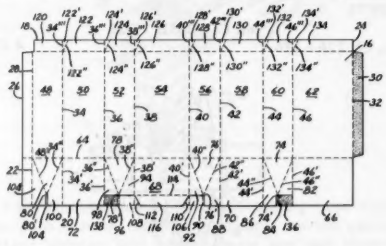
Larry C. Davenport, Indianapolis; Harold W. Layne, Beech Grove, and Jon M. Schwaner, Indianapolis, all of Ind., assignors to Inland Container Corporation, Indianapolis, Ind.

Filed Aug. 5, 1974, Ser. No. 494,756

Int. Cl.[2] B65D *13/00, 5/36*

U.S. Cl. 229—23 BT **9 Claims**

1. A container made from a foldable blank of sheet material, said container comprising a plurality of hingedly connected side panels defining a body portion having an octagonal transverse cross-sectional configuration, a first pair of generally rectangular end closure flaps hingedly connected to the ends of a pair of opposed side panels through fold lines, a second pair of generally rectangular end closure flaps hingedly connected to the ends of a different pair of opposed side panels through fold lines disposed in a plane containing the fold lines of said first pair of end closure flaps, said fold lines of said second pair of end closure flaps being generally perpendicular to the fold lines of said first pair of end closure flaps, an isosceles triangle shaped end flap connected to each of the remaining side panels through a fold line lying in the plane of the said fold lines of said first and second pairs of end closure flaps, and a trapezoidal shaped web portion interconnecting said first and second pairs of generally rectangular end



closure flaps to the adjacent triangular shaped end flaps through fold lines, said pairs of generally rectangular end closure flaps and said web portions each having an outer edge lying on a generally straight line defining an outer edge of said blank of sheet material prior to folding, the apex of each of said triangularly shaped flaps lying on a common line parallel to and spaced from said outer edge of the blank, said end closure flaps, triangular end flaps and web portions being foldable to form a closed end of the container lying in a plane substantially perpendicular to the longitudinal axis of the container with said web portions and triangular end flaps serving to interlace with said pairs of rectangular end flaps to self-lock said end flaps into their folded positions.

3,907,195

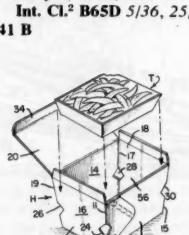
PROTECTIVE HOOD FOR CARRY-OUT FOOD AND FOLDABLE BLANK THEREFOR

Glenn E. Struble, Oxford, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,520

Int. Cl.[2] B65D *5/36, 25/00*

U.S. Cl. 229—41 B **26 Claims**



1. A protective hood for use in covering prepared food while same is held in a container and carried to destination prior to consumption thereof, said hood being foldable to a flat shipment or storage condition and erectable to a service or stand-by stacked condition and comprising:

a. a generally vertically extending sleeve with means for supporting and retaining a food container enclosed within said sleeve;

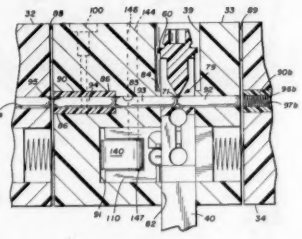
b. an open bottom; and

c. an overhead covering member.

3,907,196
VOTING MACHINE

Cothburn M. O'Neal, Dallas; Alfred M. Mayo, Richardson, both of Tex., and George William Childs, deceased, late of Dallas, Tex. (by Patricia M. Childs, executrix), assignors to Riverside Press, Inc., Dallas, Tex.

Division of Ser. No. 309,174, Nov. 24, 1972, Pat. No. 3,866,826. This application May 28, 1974, Ser. No. 473,926
Int. Cl.[2] G07C *13/00*
U.S. Cl. 235—54 D 5 Claims



1. A voting machine comprising:

a plurality of columnar frame members;

a plurality of selection keys arranged in said columns in vertical and horizontal alignment, laterally moveable between a first non-voted and second voted position;

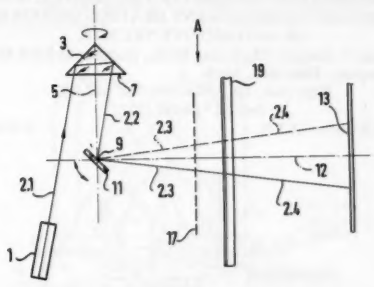
vertical interlock means for limiting the number of selections that may be made within a vertical row of keys, said vertical interlock means comprising first cam means associated with each of said keys including a through bore in said keys, block means vertically interposed between adjacent keys, said block means having a through bore, said block means shiftable from a first position relative to said vertical keys wherein said block through bores align with the through bores in said keys to a second blocking position, shiftable interlock ball means in said key through bores and associated with said key cams and said block means through bore, whereby said keys and block means define a continuous ball column in said first positions, means for establishing a vertical subcolumn in which a preselected number of vertically aligned keys may be voted, said means including means for shifting a preselected block means to said second position to intercept said ball containing column at a predetermined location to establish one limit of the subcolumn and ball receiving means located at the other limit adapted to accept a predetermined number of balls, whereby movement of selected keys to said voted position will cam a predetermined number of additional balls into said ball column and said ball receiving means thereby preventing actuation of additional voting keys when said predetermined number of balls have been caused to move into said ball receiving means; and

horizontal interlock means including second cam means carried on said voting keys, horizontally displaceable plunger means associated with said second cam means and actuable whereby movement of a preselected one of said keys will cause said second cam means to cam said associated plunger means toward said adjacent keys, and transfer means for selectively transferring the displacement of said cammed plunger to the plunger associated with said adjacent key to move said adjacent plunger into blocking engagement with its key thereby preventing actuation of said adjacent keys.

3,907,197
APPARATUS FOR AND METHODS OF READING INFORMATION CONTAINED IN CODED FORM ON INFORMATION CARRIER

Hermann Poschl, Munich, and Johann Plöckl, Unterhaching, both of Germany, assignors to Firma Erwin Sick, Optik-Elektronik, Waldkirch, Germany

Filed Aug. 2, 1974, Ser. No. 494,313
Claims priority, application Germany, Sept. 15, 1973, 2346509
Int. Cl. G06k *7/10;* G08c *9/06*
U.S. Cl. 235—61.11 E 9 Claims

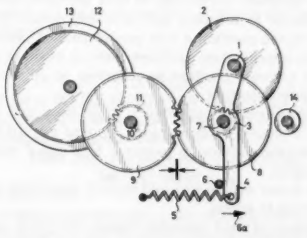


1. Apparatus for reading information presented in the form of a code of optically-contrasting regions on an information carrier, the apparatus comprising means for providing a beam of light moving in a circular path; elongate prism means positioned so that the beam of light is incident thereon and refracted thereby; means defining an elongate window extending parallel to the prism and through which the light beam refracted by the prism can pass to scan a code on an information carrier moved crosswise to the longitudinal direction of the window; the code being scanned by means of circular arcs the double radius of which is exceeding the width of the window and is also exceeding the length of the code in the direction in which it is to be read; means for unidirectionally moving the circular path in the general longitudinal direction of the prism after or while each circle is completed; means for converting light reflected from the code into electrical signals, and means arranged to interpret the electrical signals according to the scanned code.

3,907,198
RESETTABLE COUNTER

Heinz Kelch, Martinsweiler 191, D 7741 Buchenberg, and Helmut Muller, Martin-Luther-Str. 2, D 7742 St. Georgen, both of Germany

Filed Apr. 11, 1974, Ser. No. 460,068
Claims priority, application Germany, Apr. 17, 1973, 2319369
Int. Cl. G06c *15/42*
U.S. Cl. 235—144 DM 7 Claims



1. A resettable counter comprising counter wheel means; drive means for driving the counter wheel means; gear cou-

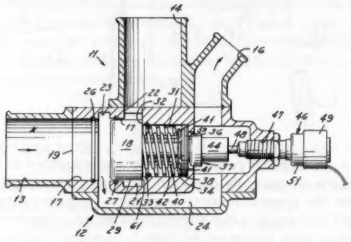
pling means between said drive means and said counter wheel means movable between an engaged position for driving said counter wheel means by said drive means and a disengaged position for allowing resetting said counter wheel means; a step-up drive between said drive means and said gear coupling means; and a step-down drive between said gear coupling means and said counter wheel means to minimize errors caused by reengagement of said gear coupling means after the latter has been disengaged for resetting said counter wheel means.

3,907,199

COMBINATION ENGINE COOLING SYSTEM AND PASSENGER COMPARTMENT HEATING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Thomas C. Kreger, Clarkston, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 18, 1974, Ser. No. 525,033
Int. Cl.[2] B60H *1/02*
U.S. Cl. 237—12.3 B **9 Claims**



1. In an automotive vehicle having a liquid cooled engine, a combination passenger compartment heating and engine cooling system comprising

a passenger compartment heater,

a radiator,

a flow control valve having an inlet and first and second outlets,

first liquid conduit means conducting liquid from the engine to the valve inlet,

second liquid conduit means connecting in series said first outlet of said valve and said radiator and said engine,

third liquid conduit means connecting in series said second outlet of said valve and said heater and said engine,

said flow control valve including a housing,

said inlet and said first and second outlets being formed in said housing,

movable means constructed to move from a first extreme position blocking said first outlet from said inlet and connecting said second outlet and said inlet to a second extreme position blocking said second outlet from said inlet and connecting said first outlet and said inlet,

first motor means comprising a temperature responsive power member connected to said movable means and constructed to displace said movable means from said first extreme position a first predetermined amount to a position intermediate said first extreme position and said second extreme position in response to an increase in coolant temperature,

second motor means constructed to displace said movable means a second predetermined amount toward said second extreme position in response to a signal external to said engine,

said first motor means and said second motor means being positioned in series,

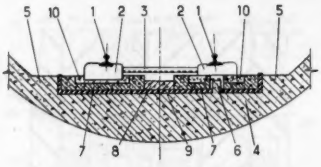
displacement of said movable means said first predetermined distance and said second predetermined distance from said first extreme position placing said movable means in said second extreme position.

3,907,200

TRACK AND METHOD OF LAYING TRACK ON A CONCRETE ROAD BED

Raoul Bernard, Grigny, France, assignor to Regie Autonome des Transports Parisiens, Paris, France

Filed Oct. 19, 1973, Ser. No. 407,843
Claims priority, application France, Oct. 24, 1972, 72.37578
Int. Cl.[2] E01B *1/00*
U.S. Cl. 238—7 **5 Claims**



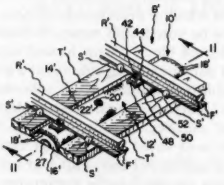
1. A method of laying a track on concrete roadbed comprising laying slabs on the roadbed, keying the slabs to the roadbed, positioning bearing members accurately on the slabs so that a rolling guide system to be carried by them has the required geometry, and finally anchoring the bearing members to the slabs.

3,907,201

INSTALLATION OF CONCRETE CONTAINING RAILROAD TIES INFLATED IN SITU

Leonard T. Dlugosz, 4 Minden Dr., Orchard Park, N.Y. 14218

Continuation-in-part of Ser. No. 198,660, Nov. 15, 1971, abandoned. This application Mar. 27, 1973, Ser. No. 345,277
Int. Cl. E01b *37/00*
U.S. Cl. 238—84 **24 Claims**



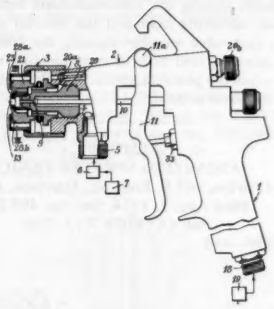
1. An inflated concrete containing railroad tie which is inserted in a railroad track bed beneath the rails and between the existing ties, and inflated in situ, wherein the improvement comprises: an elongated inflated housing including a hollow tubular casing portion formed of porous woven fabric, a cap portion closing each end of said casing portion, and an inlet port in one of said cap and casing portions, and a hardened concrete mass filling said housing following injection of a concrete forming mixture through said inlet port into said housing.

3,907,202

SPRAY-GUN APPARATUS FOR ATOMIZING PAINT OR SIMILAR LIQUIDS

Michel Binoche, Paris, France, assignor to S.K.M., Satins, France

Filed May 8, 1974, Ser. No. 468,261
Claims priority, application France, May 10, 1973, 73.17011; May 10, 1973, 73.17012
Int. Cl.[2] B05B 1/06, 1/30, 5/02, 7/04
U.S. Cl. 239—15 16 Claims



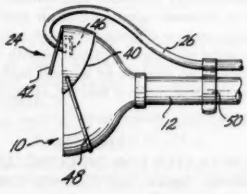
1. Apparatus for atomizing paint or a similar liquid, which comprises a spray-gun of which the atomizing head incorporates a nozzle for the hydrostatic atomization of paint projecting a flat, fan-shaped jet of paint, at least two orifices disposed on either side of said nozzle for directing air jets onto said paint jet, means for feeding paint to said nozzle under a pressure of 10 to 100 bars and means for feeding compressed air to said orifices under a pressure of 0.5 to 2 bars, the atomizing head further comprisng an annular orifice concentric to said hydrostatic atomizing nozzle supplied with compressed air substantially under the same pressure as the other orifices aforesaid, and thus producing a hollow frustoconical air jet converging to a point adjacent the outlet orifice of said nozzle.

3,907,203

SHOWER EQUIPMENT WITH LIQUID DISPENSER FOR SHOWER HEAD

Thomas L. Skillings, 511 Latourette St., Oregon City, Oreg. 97045

Continuation-in-part of Ser. No. 329,714, Feb. 5, 1973, abandoned. This application Apr. 12, 1974, Ser. No. 460,368
Int. Cl.[2] B05B 1/34, 7/30
U.S. Cl. 239—314 4 Claims



1. The combination of a shower head for ejecting shower water and a water supply therefor,

mixer means for mixing a liquid water additive into the water ejected by the shower head, said mixer means comprising a shield disposed in advance of said shower head against which at least a portion of the water ejected from said head impinges, and a diffuser element disposed behind said shield and in advance of said shower head for diffusing liquid composition leaving said conduit,

a supply unit for holding a stored supply of said liquid additive, and

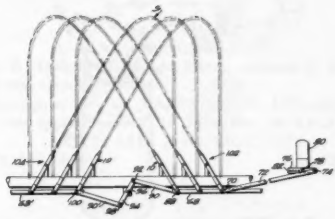
a conduit connecting said supply unit and said mixer means.

3,907,204

MUSICAL DISPLAY FOUNTAIN

Gunter Przystawik, 5230 Tamiami Ct., Cape Coral, Fla. 33904

Filed Jan. 11, 1973, Ser. No. 322,856
Int. Cl.[2] B05B 3/16; F21P 7/00; B05B 3/00
U.S. Cl. 239—242 5 Claims



1. A musical display fountain having a horizontally disposed water supply pipe and a series of water spray nozzles operably connected to the water supply pipe comprizing a mechanical linkage interposed between the water supply pipe and the series of water spray nozzles for accurately controlling the angular movement of a plurality of said spray nozzles including:

A. A series of first nipple members rigidly attached to the water supply pipe and in open communication with the interior thereof;

B. A series of second nipple members spaced vertically above the respective first series of nipple members;

C. A plurality of flexible water conduit means connecting respectively between the first and second series of nipples and having lower and upper ends and including;

D. A first series of support yoke means fixed relative to said first nipple lower ends communicating with the water supply pipe;

E. A second series of support yoke means fixed relative to said second nipple upper ends;

F. Hinged connecting means between the first and second series of lower and upper support yoke means;

G. The upper support yoke means having an extension beyond the hinged connecting means;

H. A push rod pivotally attached to the extension from each of said lower support means;

I. Drive means operably connected with said push rod to oscillate said second upper support yoke means and the second nipple and upper end: and

J. A plurality of nozzles carried in fixed relation respectively to each of said second series of nipples in axial alignment therewith.

3,907,205

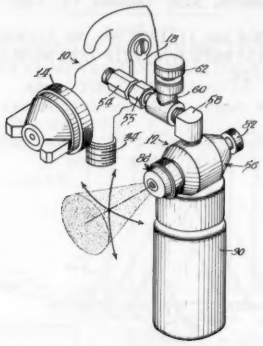
SPRAY GUN WITH AUXILIARY SPRAY ATTACHMENT

Eldon L. Shreve, Elmhurst, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed May 17, 1974, Ser. No. 470,967
Int. Cl.[2] B05B 7/32
U.S. Cl. 239—307 4 Claims

1. A multi-component spray device comprising a spray gun comprising a spray nozzle, liquid passage means in said gun for supplying said spray nozzle with a first liquid component, an internal air passage in said gun communicating between said spray nozzle and an external fitting, liquid shut off valve

means in said liquid passage, air shut off valve means in said internal air passage, means for operating said liquid and air valve means conjointly, an opening in said spray gun in communication with said internal air passage at a location between said air valve means and said spray nozzle, an auxiliary spray device supported from said spray gun and comprising a body, a siphon air spray nozzle on said body, an air passage in said body communicating with said siphon nozzle, a conduit con-



necting said body air passage to the internal air passage of said gun through the opening therein, first adjustable valve means in said conduit, a liquid passage in said body communicating with said siphon nozzle, a downwardly depending siphon tube connected to said body liquid passage, and means for supplying a second liquid component to said siphon tube, whereby operation of said spray gun causes air to be supplied to said conduit to operate said auxiliary spray device.

3,907,206

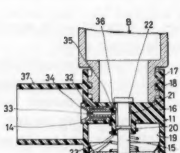
SPRAY DEVICE

Hirosi Kondo, No. 30-4, Hanazono-cho, Nayasaki, Nayasaki, Japan

Filed Sept. 9, 1974, Ser. No. 504,198

Int. Cl.[2] A62C *11/04*; **B05B** *11/06*

U.S. Cl. 239—357 **2 Claims**



1. A pressure accumulative spray device comprising a cylinder body so formed that a cylinder chamber is provided on one side of a partition wall, the other side thereof being airtightly mountable on a container, a penetration hole provided through the partition wall being divided into a liquid admitting hole and a compressed air admitting hole by a piston rod penetrating said penetration hole, a nozzle communicating with both said holes being mounted on the outer periphery of the cylinder body so as to suck and spray the liquid when compressed air is spurted; a piston fitted into the cylinder chamber of the cylinder body so as to be airtightly slidable on the inner periphery of said cylinder chamber when pressure is applied thereto thereby producing compressed air, said piston enabling to lead the outside air into the cylinder chamber at its return travel, said piston further having an air vent and being urged by restoring resilience by means of a spring member; a sustenance plate secured to the piston and connecting said piston to the piston rod, said sustenance plate causing the cylinder chamber to communicate with the interior of the piston; a piston built within the foregoing piston so as to be airtightly slidable by the compressed air produced when pressure is applied to the foregoing piston; a stopper provided with a spring member for imparting restoring resilience to the piston so as to accumulatively pressurize the compressed air, the stopper opening or closing the communication between the liquid admitting hole and the container; and a valve member ordinarily closing the communication between the compressed air admitting hole and the interior of the cylinder chamber, said valve member causing the compressed air to spurt by allowing said hole to communicate with the piston chamber when the piston is pressed and the piston rod reaches the limit of its movement.

3,907,207

ATOMIZING SPRAYER DEVICE

John W. O'Brien, 607 S. Kelly St., Harrison, Ark. 72601

Filed Aug. 7, 1974, Ser. No. 495,267

Int. Cl.[2] B05B *7/12, 7/04*

U.S. Cl. 239—415 **8 Claims**

1. Spraying apparatus for use with a liquid source and a pressurized air source to produce a fine liquid spray, said apparatus comprising:

a spray head having an air-liquid mixing chamber therein; liquid delivery means interconnecting said spray head and said liquid source;

air delivery means interconnecting said spray head and said air source;

a liquid passage disposed through said spray head for directing liquid from said liquid delivery means to said mixing chamber, said liquid passage including a central liquid discharge orifice to said mixing chamber;

an air passage disposed through said spray head for discharging air from said air delivery means to said mixing chamber, said air passage including a circular discharge annulus to said mixing chamber concentrically disposed with respect to said liquid orifice to deliver an annular curtain of air substantially parallel to the liquid issuing from said liquid orifice to the mixing chamber;

a liquid impingement member disposed within said mixing chamber and having a flat circular impingement surface substantially perpendicular to said liquid orifice to cause liquid issuing therefrom to spread radially outward and perpendicularly intersect said annular curtain of air to form an intimate admixture of air and liquid; and

a discharge orifice disposed through said spray head communicating said mixing chamber with the atmosphere to discharge said mixture of air and liquid in said chamber to the atmosphere as a fine liquid spray.

3,907,208

APPARATUS FOR INDUCING AIR FLOW

James Malcolm Agnew, and Granville Collis James, both of Burton on Trent, England, assignors to Coal Industry (Patents) Ltd., London, England

Filed Feb. 28, 1974, Ser. No. 446,910

Claims priority, application United Kingdom, Mar. 16, 1973, 12737/73

Int. Cl.[2] F04F *5/02*

U.S. Cl. 239—428.5 **10 Claims**

1. Apparatus for inducing air flow comprising an elongated narrow member defining an elongated narrow passage which

is open at one longitudinal end, a fluid outlet nozzle mounted in the member near the open end and arranged to direct a jet of fluid along the passage toward the open end, and air-inlet

means comprising a long, narrow, lateral opening extending longitudinally along a substantial portion of the member for inducing air flow into the member through all of the long narrow opening.

3,907,209

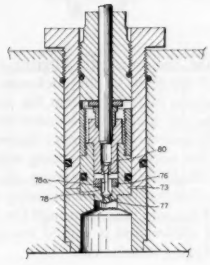
COMPRESSION IGNITION ENGINE

Max G. Fiedler, 585 Pugh Rd., Wayne, Pa. 19087

Filed Apr. 30, 1973, Ser. No. 355,495

Int. Cl.[2] B05B *1/30*

U.S. Cl. 239—533 **1 Claim**



1. Fuel nozzle means for a compression-ignition engine, comprising a first sleeve closed at one end and having a plurality of orifices, a shoulder formed on said one end of said first sleeve, a resilient member seated on said shoulder, a second sleeve, one end of said second sleeve positioned within said first sleeve, said one end of said second sleeve forming a valve seat, a valve member having a passage therethrough slidably mounted within said first sleeve, one end of the valve member being positioned between the resilient member and the valve seat, whereby said valve member is biased to a closed position against the valve seat, said second sleeve having a passage for supplying fuel to said valve member, and said valve member having a passage and a plurality of orifices formed therein so that when the valve member is forced to the open position, the resilient member is compressed and fuel flows through the passage of the valve member and out through the orifices of the first sleeve into the combustion chamber.

3,907,210

APPARATUS TO IMPROVE COMBUSTION OF FUEL

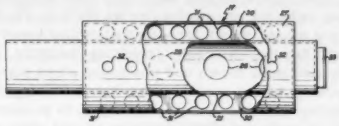
Irving A. Dow, Jr., 20 Vista Ave., Elizabeth, N.J. 07208, and Carl A. Gersitz, Brick Town, N.J., assignors to Irving A. Dow, Jr., Elizabeth, N.J.

Filed Apr. 4, 1974, Ser. No. 457,878

Int. Cl.[2] B05B *01/14*

U.S. Cl. 239—553.3 **10 Claims**

1. An apparatus for delivering preheated secondary air into a burner flame comprising a sleeve adapted to receive air from a fan and having a plurality of longitudinally spaced openings in its side wall, an envelope surrounding said sleeve and side wall openings and joined to the sleeve to form between the sleeve and the envelope a chamber for air, said envelope having a plurality of longitudinally spaced air discharge openings formed through its side wall remotely from the sleeve wall openings, and baffle means interposed between the sleeve and envelope side wall openings to regulate the passage of air from the former to the latter, said baffle means extending from the outer surface of said sleeve to the inner surface of said envelope, thereby defining a first and second cavity, means for



forcing said air to contact said envelope in a lingering fashion for causing heat transfer from said envelope to said air comprising openings in said baffle means.

3,907,211

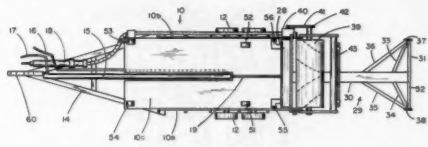
UNLOADING DEVICES

Daniel W. O'Reilly, Goodhue, Minn., assignor to Joseph D. O'Reilly, Goodhue, Minn.

Continuation of Ser. No. 378,685, July 12, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,553

Int. Cl.[2] A01C *19/00*; **E01C** *19/20*

U.S. Cl. 239—676 **20 Claims**



1. In a bulk material unloading device of the type having a boxlike member for receiving said bulk material defined by two generally opposing side walls and a bottom and having an end gate movable along said bottom in a path between said side walls for pushing said bulk material out of said boxlike member, the improvement which comprises:

means extending from said end gate and movable therewith along said bottom for providing a supporting surface for at least a portion of said bulk material.

3,907,212

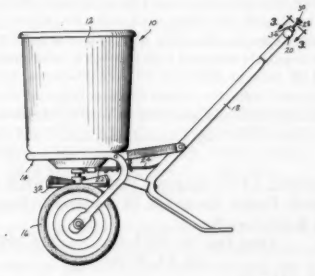
MAGNETICALLY ADJUSTABLE ACTUATOR MEANS FOR A MATERIAL SPREADER

William L. Ullom, Wabash, Ind., assignor to The Cyclone Seeder Company, Inc., Urbana, Ind.

Filed Sept. 20, 1974, Ser. No. 507,737

Int. Cl.[2] A01C *17/00*; **B05B** *9/00*

U.S. Cl. 239—685 **5 Claims**



1. In a spreader for fluent material, said spreader including a receptacle means to contain said material, a discharge opening in said receptacle means, regulating means in association with said discharge opening for controlling the rate of material

flow from said receptacle means, a ferrous actuator rod means associated with said regulating means which upon longitudinal movement shifts said regulating means to control said rate of material flow, guide means supporting said actuator rod means and including an opening therein through which said actuator rod means extends for guided supported longitudinal movement, the improvement comprising magnetic means carried by said guide means and positioned about said guide means opening therein, said magnetic means forming a magnetic coupling with said actuator rod means to position said rod means in a selected location relative to said guide means and thereby selectively control the rate of material flow from said receptacle.

3,907,213

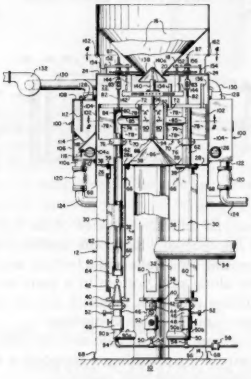
IMPACT SCRUBBER

John H. Kauffman, Richland Center, Wis., assignor to National Engineering Company, Chicago, Ill.

Filed May 2, 1974, Ser. No. 466,302

Int. Cl.[2] B02C *19/06*; **B24C** *3/00*

U.S. Cl. 241—40 **14 Claims**



1. An impact scrubber for removing coating materials from the surfaces of particulate matter such as foundry sand and the like comprises at least one lift tube unit having a lift tube with an inlet end and an opposite end for containing a high velocity fluidized stream of said matter, fluid injector means spaced adjacent said inlet end for carrying said particulate matter into said inlet end and forming a fluidized stream of said matter in said lift tube, fluid stream deflector means adjacent and in communication with said opposite end of said lift tube, means mounting said deflector means for rotation around a longitudinal axis of said lift tube, said deflector means including a discharge tube for directing said fluidized matter in a single stream angularly outward with respect to said longitudinal axis of said lift tube at different rotative positions, and means for rotating said deflector means for directing said discharge tube in a selected one of a plurality of relative rotative positions.

3,907,214

BAGGING ATTACHMENT FOR SHREDDER-BAGGER

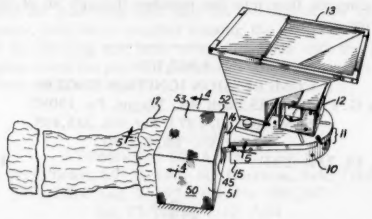
Douglas D. Dankel, Kankakee, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Jan. 16, 1973, Ser. No. 324,209

Int. Cl. B02b *7/02*

U.S. Cl. 241—79 **4 Claims**

4. The combination of a shredding machine having a discharge chute, a bagging attachment, and a refuse bag, the opening in the bag being spaced apart from the discharge chute, the bagging attachment being interposed directly between the discharge chute and the opening in the bag, the attachment being an enclosure having an inlet opening, an outlet opening, and a filtering element, the inlet opening being in direct generally alined communication with the outlet opening, the inlet opening being alined with the discharge chute, and the outlet opening being alined with the opening in the bag, so that the flow from the discharge chute is discharged in a concentrated undiverted stream into the inlet opening of the attachment, through the attachment, and into the mouth of the bag, bag securement means cooperatively associated with the enclosure for holding the mouth of the refuse bag in an open configuration and securing the mouth around the outlet



opening and to the enclosure, the filtering element being a porous portion of the walls of the enclosure, the bag being formed of non-porous material so that the porous portion of the enclosure provides the sole communication between the interior of the bag and the atmosphere surrounding the bagging attachment, the outlet opening being substantially larger in cross section than the inlet opening and the incoming stream whereby all of the air in the incoming stream entering the bag is turned back and passes through the space surrounding the incoming stream and is vented through the filtering element of the bagging attachment.

3,907,215

MANUALLY OPERATED FOOD CHOPPER

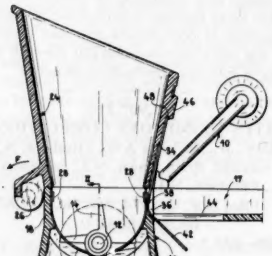
Jean Mantelet, Paris, France, assignor to Moulinex, Société Anonyme, Bagnolet, France

Filed May 13, 1974, Ser. No. 469,683

Claims priority, application France, May 23, 1973, 73.18689

Int. Cl.[2] B02C *18/08*

U.S. Cl. 241—88.4 **4 Claims**



1. A manually operated food chopper comprising a shaft having a series of chopper blades thereon, a plastic cradle in which the shaft is supported for rotation about a horizontal axis, a spring steel slotted plate retained in the cradle below

the shaft and being of a generally U-shaped configuration having two legs at the ends of which means are disposed which resiliently engage with opposite side walls of the cradle, a plastic hopper mounted for vertical swinging movement on the cradle between an upright position in which the hopper feeds downwardly into the cradle and retains the shaft in the cradle and a downwardly swung position in which the hopper releases the shaft, and a leaf spring secured at one end to the hopper for releasably retaining the hopper on the cradle in said upright position, one of said legs of the steel plate having thereon retaining means over which snaps a portion of said leaf spring.

3,907,216

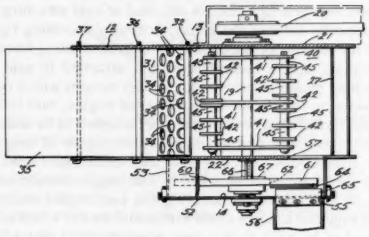
DISINTEGRATION APPARATUS

Albert E. MacKissic, Parker Ford, and Robert C. Kolb, Spring City, both of Pa., assignors to Amerind-MacKissic, Inc., Parker Ford, Pa.

Filed Mar. 26, 1973, Ser. No. 344,907

Int. Cl.[2] B02C *13/04, 21/02*

U.S. Cl. 241—152 A **9 Claims**



1. Apparatus for disintegrating materials comprising a housing, a rotary drive shaft extending through said housing, means to rotate said shaft in a clockwise direction, said housing including a pair of sidewalls and a cover plate disposed parallel to one another and substantially perpendicular to said rotary shaft, arcuate wall means intermediate said sidewalls to define a shredding chamber surrounding said shaft, said arcuate wall means being discontinuous providing openings for radial infeed of raw material into said chamber and radial discharge of shredded material out of said chamber and including an imperforate wall extending from approximately the 1:00 o'clock position past the 6:00 o'clock position, said housing including a circumferential wall surrounding said shaft intermediate one of said sidewalls and the cover plate to define a chipping chamber, said one sidewall being stationary and having an opening receiving said rotary shaft, said stationary wall extending radially from said shaft outwardly beyond said arcuate wall and said circumferential wall, said one sidewall constituting a common sidewall separating said shredding chamber and said chipping chamber, said cover plate having a feed opening therein positioned radially outward of said shaft and confronting said stationary wall for introducing material to be chipped into said chipping chamber, and said stationary sidewall having a discharge opening positioned radially outward of said shaft at a position corresponding to 1:00 o'clock for discharging chipped material from said chipping chamber into said shredding chamber, a shredding assembly in said shredding chamber to shred the material introduced thereinto and to discharge the shredded material radially through said discharge openings, a chipping assembly in said chipping chamber for chipping material introduced through said feed opening in the cover plate and for discharging the chipped material through said discharge opening in said one sidewall, said chipping assembly comprising a disc mounted for rotation with said drive shaft between said stationary wall and said cover plate and having a slot therein defining a chipping throat radially outward of said shaft, means providing a cutting edge adjacent said throat and operable to travel past said feed opening in the cover plate to chip said material and deflect the chipped material through said throat against said stationary wall, and means between said disc and said wall to wipe said chipped material circumferentially of the shaft along the wall between the rotary disc and the stationary wall and to direct the chipped material through said discharge opening.

3,907,217

WINDING APPARATUS

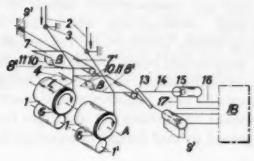
Felix Graf, Winterthur; Albert Rüegg, Pfaffikon; Dieter Guldenfels, Muttenz, and Hans Schürmann, Emmen, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed May 17, 1973, Ser. No. 361,213

Claims priority, application Switzerland, June 9, 1972, 8572/72

Int. Cl.[2] B65H *54/34*

U.S. Cl. 242—18 PW **22 Claims**



1. A winding apparatus comprising a driven thread package-support member having a lengthwise axis, a self-threading traversing thread guide for guiding the thread within the traversing width of a thread traversing zone of a cross-wound package, a movable auxiliary thread guide for guiding the thread within a waste winding zone of the thread package-support member, means mounting said auxiliary thread guide to be adjustable substantially in the lengthwise direction of the cross-wound package and transversely with respect to the axis of the thread package-support member, first adjustment means cooperating with said mounting means for said auxiliary thread guide for moving said auxiliary thread guide in the lengthwise direction of the cross-wound package, second adjustment means cooperating with said mounting means for moving said auxiliary thread guide transversely with respect to the lengthwise axis of the thread package-support member, said auxiliary thread guide including means for catching the thread at the thread traversing zone and for lifting the thread out of engagement with the traversing thread guide when engaged thereby, and wherein said catching means of said auxiliary thread guide includes structure for forming a second waste winding in the event of premature interruption of the winding operation or completion of the cross-wound package.

3,907,218

HEAVIER-THAN-AIR FREIGHT AIRCRAFT HAVING LIGHTER THAN AIR GAS COMPARTMENTS

Ralph H. Miller, 13619 Sunset, Detroit, Mich. 48212

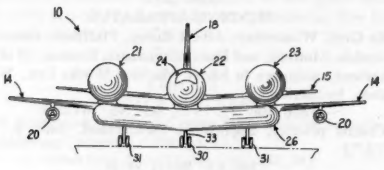
Filed May 2, 1974, Ser. No. 466,418

Int. Cl.[2] B64C *1/00*

U.S. Cl. 244—5 **5 Claims**

1. Improvement in heavier-than-air freight aircraft having forward thrust means, wing means, rear fin and rudder means, and lighter-than-air gas lift means for enhancing the aerodynamic lift provided by said forward thrust means and wing means, said improvement comprising respective forward and rear wing means, three equally widthwise spaced apart gas compartment means containing lighter-than-air gas disposed vertically above said forward wing means, a single freight compartment means disposed vertically below all of said gas

compartment means, said forward and rear wing means and said gas and freight compartment means joined to each other to provide framing rigidity for said aircraft, said rear fin and rudder means mounted upon the center one of said gas compartment means so as to upstand vertically therefrom to obtain a clear aerodynamic cut into the air, a pilot compartment at the forward end of the center one of said gas compartment



means, each said gas compartment means of substantially uniform transverse cross-section, each said compartment means extending axially substantially full length of said aircraft, said rear wing means being a substantially full width rear wing disposed vertically above said forward wing means so as to have a substantially clear aerodynamic cut into the air, said forward wing means comprising left and right forward partial wing sections joined to said freight compartment means.

3,907,219

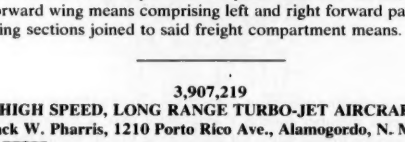
HIGH SPEED, LONG RANGE TURBO-JET AIRCRAFT

Jack W. Pharris, 1210 Porto Rico Ave., Alamogordo, N. Mex. 88310

Continuation-in-part of Ser. No. 297,911, Oct. 16, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 409,887

Int. Cl. B64c *27/22, 27/30*

U.S. Cl. 244—7 A **10 Claims**



2. In an aircraft having an elongated fuselage, a fixed wing secured to the fuselage, an attitude controlling tail assembly secured to the fuselage and reaction thrust generating means for forwardly propelling the fuselage along a longitudinal axis thereof; a rotor assembly, a rotary wing means connected to the rotor assembly for rotation during helicopter and autogyro operations, power operated means connected to the rotor assembly for displacement between retracted and extended positions relative to the fuselage, disengageable transmission means drivingly connecting the thrust generating means to the rotor and tail assemblies for powered rotation during said helicopter operation, control means for selectively disengaging the transmission means to unload the rotor and tail assemblies from the thrust generating means, and means for conditioning the thrust generating means while unloaded from the rotor and tail assemblies during autogyro and fixed wing operations to increase forward propulsion of the fuselage, the thrust generating means comprising a fan jet engine having a compressor and a turbine to which the transmission means is connected, said conditioning means including intake control means for reducing inflow of air to the compressor during helicopter operation.

3,907,220

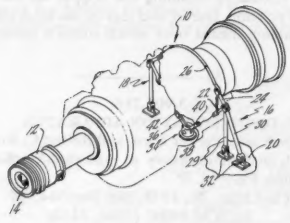
REAR ENGINE REDUNDANT MOUNT

Armand Francis Amelio, Yonkers, N.Y., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 14, 1974, Ser. No. 451,661

Int. Cl.² B64D *27/16*

U.S. Cl. 244—54 **8 Claims**



1. A mounting system for the rear end of a jet aircraft engine in which the engine has peripheral mount attaching means, two primary mounts attached to said attaching means on opposite sides of the engine normally providing rigid support for the rear of the engine capable of resisting forces in all directions, and a redundant mount attached to said mount attaching means between said primary mounts which normally provides no significant support for the engine, said redundant mount including a housing member adapted to be attached to aircraft structure and having a socket, a pair of links having convergent ends extended into said socket, said links having their divergent ends attached to said engine mount attaching means, and means for securing the convergent ends of said links together to form a hub within said socket which is loosely encircled by said socket and normally held out of engine supporting relationship with the walls of said socket by said primary mounts.

3,907,221

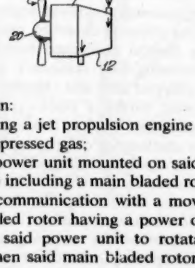
RAM FLUID TURBINE

Joseph A. Goodrich, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 75,905, Sept. 28, 1970, Pat. No. 3,835,641. This application Dec. 4, 1973, Ser. No. 421,567

Int. Cl.² B64D *41/00*

U.S. Cl. 244—58 **7 Claims**



1. In combination:

a vehicle including a jet propulsion engine that provides a source of compressed gas;

a rotary-driven power unit mounted on said vehicle;

a ram air turbine including a main bladed rotor arranged to be placed in communication with a moving air stream, said main bladed rotor having a power output operably connected to said power unit to rotatably drive said power unit when said main bladed rotor is driven by a moving airstream;

an auxiliary turbine including an auxiliary bladed rotor operably connected to drive said main bladed rotor and said power unit when driven by compressed gas from said jet propulsion engine; and

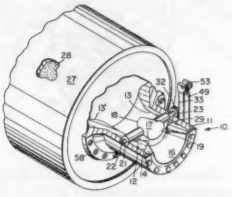
means for conducting bleed gas directly from said jet propulsion engine to said auxiliary bladed rotor to drive said auxiliary rotor and said main bladed rotor, said main bladed rotor mounted at one end of said power unit, and said auxiliary turbine mounted at the other end of said power unit.

3,907,222

VARIABLE THRUST ROCKET MOTOR NOZZLE ASSEMBLY, AND ROCKET ASSEMBLY CONTAINING SAME

Tommy Darrel McComas, La Vale, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sept. 14, 1973, Ser. No. 397,483
Int. Cl. B64c *15/08*
U.S. Cl. 244—74 **7 Claims**



1. A convergent-divergent rocket motor nozzle assembly including coaxially disposed convergent, divergent and intermediate throat sections, comprising

an imperforate thrust control element facing said throat upstream therefrom and rotatable on a transverse axis upstream from said throat section and substantially normal to the throat axis;

an end section of said control member dimensioned for emplacement within said convergent section to form an annulus with the inner wall of said convergent section having a minimum cross-sectional area less than the minimum cross-sectional area of said throat;

said transverse axis spaced from said throat and from the end of said end section for rotation of said control element 180° thereon to rotatably move said end section downstream and upstream from said axis respectively into and from position in said convergent section to form or eliminate said annulus;

and means for rotating said element 180° on said transverse axis to move said element end section into and from said position for forming said annulus, whereby said element can be rotated about said transverse axis to provide a variable throat area for control of thrust of a propellant motor when disposed in propulsion relationship with said nozzle assembly.

3,907,223

VOICE-DIRECTED AIRCRAFT NAVIGATION SYSTEM AND DIRECTION FINDER

Carl J. Crane, P.O. Box 316, Helotes, Tex. 78023

Continuation-in-part of Ser. No. 262,528, June 14, 1972, Pat. No. 3,840,877. This application Apr. 25, 1974, Ser. No. 463,957
Int. Cl.[2] B64C *13/20;* **G01S** *9/22*
U.S. Cl. 244—77 A **1 Claim**

1. In combination with a voice directed aircraft navigation system having

a transmitter for lateral guidance of an aircraft during landing and takeoff;

a transmitting means on the aircraft emitting radio signals of selected frequency and for a pre-set time to a direction finder;

means defining a runway center-line course which is taken by the aircraft during approach, landing, and takeoff as a landing runway equipped with a radio localizer transmitter for guiding said aircraft along the extended center-line path of the said runway; and

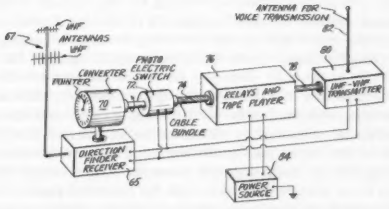
an aircraft monitoring system for informing the aircraft crew by voice the longitudinal location of the aircraft at preselected intervals along its path to and from the runway as well as along the runway, said monitoring system comprising:

at least one ground based automatic direction finder including a rotating element adjacent the runway for tracking the aircraft by means of radio signals emitted by the aircraft in the approach as well as in the landing path, said automatic direction finder having a receiver tunable to the said selected transmitter frequency of the aircraft transmitting means;

sequential switching means including a photoelectrical switching means connected to the rotating element of said automatic direction finder, which constitutes a rotation element of the direction finder and is provided with means for connecting the said rotation element of the automatic direction finder to a sequential switch;

a multiple track tape player having preselected tracks, said switching means energizing in succession preselected tracks of said tape player;

voice modulated broadcasting means including interconnected radio transmitter means supplied by the preselected tracks of said multiple track tape player to broadcast to the aircraft receiver of the aircraft being tracked



a sound and voice transmission corresponding to the track selector and identifying the position of the aircraft along the center-line course, said voice modulated means broadcasting on a frequency other than that in use by the transmitter of the aircraft, whose input is derived from the output of an associated multiple track tape player;

the sequential switch of said sequential switching means providing means for electrically coupling that particular track of the multiple track tape player which contains the recorded spoken words of aircraft position which corresponds to the instant position of the aircraft being tracked along the said localizer path by the said automatic direction finder and to provide sequential switching to selected tracks of said multiple track tape player so arranged to permit energization of the said selected track of a duration ample to permit the voice broadcast of aircraft position by repetition of words descriptive of the aircraft position;

radio receiver means in the aircraft for receiving each prerecorded voice message in proper sequence from the tape player which is transmitted by the radio transmitter means at the automatic direction finder whereby there is received voice reception identifying positioning movements of the aircraft along the runway extended; and,

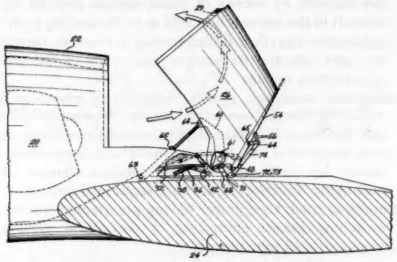
audio speaker means connected to the radio receiver means for presenting to the aircraft crew the spoken words generated and broadcast by the said tape player transmitter combination of the said automatic direction finder.

3,907,224

VARIABLE RAMP EXHAUST NOZZLE AND CLAMSHELL REVERSER

Gabriel E. Stearns, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Naples, Italy

Division of Ser. No. 365,933, June 1, 1973, Pat. No. 3,844,482.
This application Apr. 18, 1974, Ser. No. 462,052
Int. Cl.[2] B64D *33/04*
U.S. Cl. 244—110 B 4 Claims



1. Apparatus for varying the exhaust nozzle area and reversing the forward thrust of a jet engine mounted in a nacelle positioned forward and above on an aircraft wing so as to form a D-shaped exhaust nozzle exit for flow discharge over the upper wing surface comprising: a clamshell panel forming the aft semi-circular portion of the D-shaped exhaust nozzle; a ramp comprising segments forming the flat surface of the D-shaped exhaust nozzle fore and aft of the nozzle exit plane over the upper surface of the wing; means for raising and lowering the ramp to vary the exhaust nozzle area; an aft ramp segment rearwardly disposed from the exhaust nozzle and being pivotally adjustable to an upward position; and means operating independently of the ramp raising and lowering means, for pivoting the clamshell panel aft and downward toward the upper surface of the wing in combination with raising the aft ramp segment from the upper surface of the wing to an abutment relation with the clamshell panel to form a clamshell blocker door arrangement for reversing the exhaust flow.

3,907,225

SPACECRAFT FOR DEPLOYING OBJECTS INTO SELECTED FLIGHT PATHS

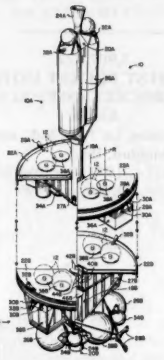
Robert S. Welther, Los Angeles, Calif., assignor to TRW Inc., Cedondo Beach, Calif.

Filed Dec. 17, 1973, Ser. No. 425,397
Int. Cl. F42b *15/00*
U.S. Cl. 244—158 4 Claims

1. A spacecraft for deploying objects into selected flight paths, comprising:

a pair of deployment vehicles each having a longitudinal axis, a main propulsion thruster and pitch, roll, and yaw thrusters for propelling the vehicle along and orienting the vehicle about axes transverse to said longitudinal axis, a pair of diametrically opposed sector-shaped platforms in a plane normal to said longitudinal axis, deployment means on said platforms for mounting and deploying a number of said objects, and control means for actuating said thrusters and deployment means; and

means for releasably joining said vehicles in assembled relation with the longitudinal axes of the vehicles aligned and with the platforms of each vehicle positioned between and in the plane of the platforms of the other vehicle such that the several platforms form a substantially circular platform shape, whereby the assembled vehicles form a compact unitary spacecraft which may be installed within a launch vehicle and launched into a selected initial flight path and thereafter said deployment vehicles may be separated and propelled upwardly and downwardly along local range insensitive axes for deployment of objects from the vehicles along additional flight paths intersecting said axes.

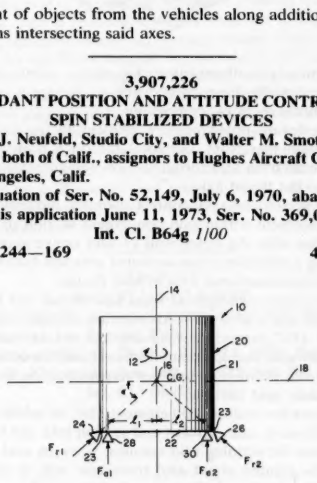


3,907,226

REDUNDANT POSITION AND ATTITUDE CONTROL FOR SPIN STABILIZED DEVICES

Murray J. Neufeld, Studio City, and Walter M. Smotrys, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 52,149, July 6, 1970, abandoned.
This application June 11, 1973, Ser. No. 369,021
Int. Cl. B64g *1/00*
U.S. Cl. 244—169 46 Claims



1. In a spin stabilized device having a center of gravity, a spin axis passing through the center of gravity, and an external surface defining the outer limits of the device and providing at least one end surface passing through the spin axis at a point displaced from the center of gravity, an arrangement for control of the position and attitude of the device with respect to a fixed reference point comprising:

a first pair of thrust producing means positioned diametrically opposite to each other about the spin axis and secured to the end surface in a manner such as to provide thrusts whose vectors are directed parallel to the spin axis when said first pair of thrust producing means are actuated; and

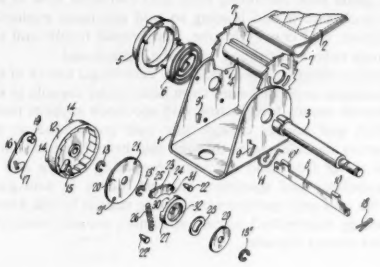
a second pair of thrust producing means positioned diametrically opposite to each other about the spin axis and secured to the end surface in such a manner as to provide thrusts whose vectors are directed to pass through the center of gravity when said second pair of thrust producing means are actuated, the direction of the thrusts of said second pair passing at an angle ϵ through any plane normal to the spin axis, the angle ϵ being $0° < \epsilon < 90°$.

3,907,227

SAFETY BELT RETRACTOR

Takezo Takada, deceased, late of Tokyo, Japan (by Juichiro Takada, heir), assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,764
Claims priority, application Japan, Feb. 1, 1973, 48-12412
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 **8 Claims**



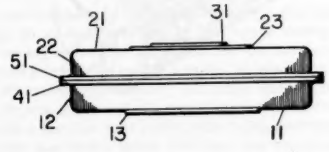
1. An automatic locking retractor comprising a spring biased retractor reel including a shaft rotatable therewith, a first ratchet wheel rotatable with said reel, a brake first pawl member rockable between positions engaging and disengaging said first ratchet wheel, an internally toothed second ratchet wheel journalled on said shaft, means coupling said second ratchet wheel to said first pawl member to rock said pawl member to first ratchet wheel engage position with a predetermined rotation of said second ratchet reel, a fly wheel freely rotatable on said shaft, a second pawl member mounted on said fly wheel and rockable between positions engaging and disengaging said second ratchet wheel and spring biased to a ratchet disengage position and including a follower portion and a cam member mounted on and rotatable by said shaft in engagement with said follower portion to shift said second pawl member into engagement with said second ratchet wheel upon said fly wheel lagging the rotation of said cam member whereby to rock said second ratchet wheel and advance said first pawl member into engagement with said first ratchet wheel.

3,907,228

WIRE DISPENSER

Charles W. Lewis, 4537 E. 8th St., Tucson, Ariz. 85711

Filed June 21, 1974, Ser. No. 481,540
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129 **9 Claims**



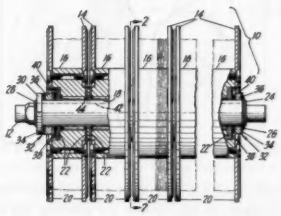
1. An improved Wire Dispenser comprising a lower circular dish having a floor, a cylindrical wall, said cylindrical wall having an inward taper at the portion most distal from said floor, and outwardly extending flange operably connected to said cylindrical wall at the most distal point from said floor, said flange being parallel to said floor, and a central aperture, said aperture having an inwardly extending coaming; an upper circular dish having a roof, a cylindrical wall, said cylindrical wall having an inward taper at the portion most distal to said roof, an outwardly extending flange connected to said cylindrical wall at a point most distal to said roof and parallel to said roof, and a central aperture, said aperature having an outwardly extending coaming; and means for holding said upper dish flange, said upper dish being in a concave downward position, to said lower dish flange, said lower dish being in a concave upward position.

3,907,229

BOBBIN ASSEMBLY

Vincent A. Iannucci, West Lawn, and Rudolf H. Haehnel, Reading, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 16, 1974, Ser. No. 470,534
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129.8 **2 Claims**



1. An improved bobbin assembly of the type utilized on wire wrapping machines, wherein said improvement comprises:

a shaft having a longitudinal slot therein extending between the ends of said shaft;

a plurality of bobbins rotatably mounted on said shaft;

a plurality of friction washers each of which is located between a pair of adjacent said bobbins for separation thereof, each said friction washer being keyed to said slot for longitudinal movement along said shaft without rotation thereabout;

retaining means at said ends of said shaft for applying an axial braking force to each of said bobbins, said braking force being transferred to each of said bobbins by said friction washers independently of and unaffected by the rotation of others of said bobbins in said assembly; and

sliding contact surfaces between said bobbins and said friction washers having a relatively low coefficient of friction so that a relatively large magnitude for said braking force may be utilized to substantially reduce an effect on the operation of said assembly by any force in an axial direction along said shaft which may be produced by the weight of said bobbins.

3,907,230

TAPE DRIVE SYSTEM

Jean Pierre Merle, Clamart, and Claude Pavie, Montesson, both of France, assignors to Schlumberger Instruments et Systemes, Paris, France

Filed Aug. 6, 1973, Ser. No. 385,690
Claims priority, application France, Aug. 21, 1972, 72.29775; Mar. 6, 1973, 07935
Int. Cl.² G11B *15/32, 23/08, 23/06;* **B65H** *17/14*
U.S. Cl. 242—192 **19 Claims**

1. A tape drive system comprising

a frame,

means for rotatably mounting supply and takeup reels on said frame; tape guiding means on said frame for guiding a tape web traveling along a path between said supply and takeup reels;

means for unwinding said tape from said supply reel and for driving said tape along said path;

means for winding said tape on said takeup reel and for producing a tension on said tape web, comprising

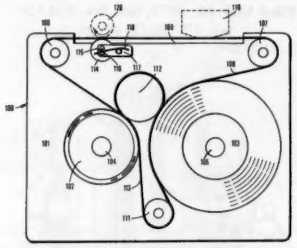
a pretensioned endless elastic belt having

a first portion engaging an arcuate portion of the tape on said supply reel without slippage to be driven by said tape,

a second portion engaging an arcuate portion of the tape on said takeup reel without slippage for winding said tape on said takeup reel,

a third portion connecting first ends of said first and second portions, and

a fourth portion connecting second ends of said first and second portions;



first idler roller means mounted for rotation substantially without friction on said frame for guiding but not driving said third belt portion; and

second roller means rotatable substantially without friction and movable relative to said frame for guiding said fourth belt portion,

said second roller means being urged by said belt toward said reels for squeezing and elastically deforming said second ends of said first and second belt portions against said supply and takeup reels respectively to oppose movement of said first belt portion thereby producing a tension on said tape web when said tape is unwound from said supply reel.

3,907,231

PNEUMATIC CONVEYOR TUBE SYSTEM

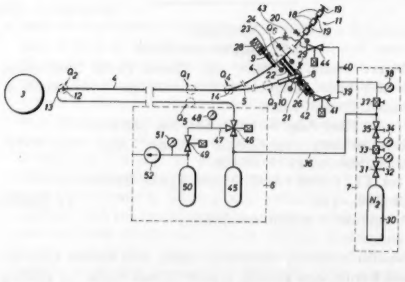
Hans-Jürg Kreiner, Munich, Germany, assignor to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munich, Neuherberg, Germany

Filed Oct. 22, 1974, Ser. No. 517,156

Claims priority, application Germany, Oct. 26, 1973, 2353683

Int. Cl.[2] B65G *51/04*

U.S. Cl. 243—2 **29 Claims**



1. In a pneumatic conveyor tube system including tube means extending from a specimen preparing station to a specimen evaluating station; a carrier capsule arranged for travel in the tube means; pneumatic means for effecting travel of the carrier capsule in the tube means; a specimen support means supporting the specimen and receivable in the carrier capsule; the improvement comprising in combination:

a. a conveyor tube extending from said specimen preparing station; said conveyor tube including orienting means for maintaining the angular position of said carrier capsule unchanged within and with respect to said conveyor tube;

b. a branch means in said conveyor tube at a location spaced from said specimen preparing station and said specimen evaluating station;

c. a guide tube extending from said conveyor tube at said branch means and leading to said specimen evaluating station, said conveyor tube, said branch means and said guide tube constituting said tube means; and

d. means effecting a separation by centrifugal forces of said specimen support means from said carrier capsule in said branch means for ejecting said specimen support means from said carrier capsule into said guide tube as said carrier capsule passes through said branch means during its travel from said specimen preparing station and for propelling said specimen support means in said guide tube into said specimen evaluating station by the kinetic energy transmitted to said specimen support means by said carrier capsule.

3,907,232

HOLDING CORE FOR YARN SPOOLS, PIRNS, AND THE LIKE

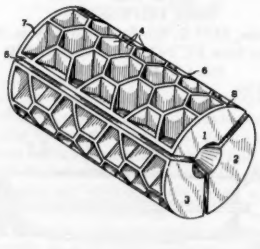
Paul Odermatt, Steinhausen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Feb. 27, 1974, Ser. No. 446,139

Claims priority, application Switzerland, Apr. 24, 1973, 5802/73

Int. Cl.[2] B65H *75/30, 75/22*

U.S. Cl. 242—46.2 **4 Claims**



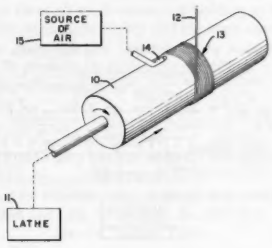
1. Segmental core insert to form a core element for winding bodies and to hold the winding bodies on the spooling spindles comprising

a plurality of similar segments, each being a sector of a cylinder, each cylinder sector having a central portion adapted to fit against the spindle and a radially surrounding portion, said radially surrounding portion being formed as an open, cellular, honeycomb structure.

3,907,233
METHOD OF WINDING THIN FILAMENTARY MATERIALS

Richard Danby Uncapher, San Fernando, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 19, 1971, Ser. No. 107,778
Int. Cl. B65h *54/00*
U.S. Cl. 242—47 **1 Claim**

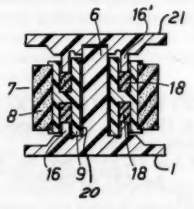


1. The method of packing fiber-like materials, said method comprising the steps of: winding a flexible filamentary material in a helix on a drum; and blowing the last turn being wound against the next turn adjacent thereto.

3,907,234
ENDLESS TAPE CARTRIDGE

Takateru Sato; Haruo Shiba, and Masaoki Sekine, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,899
Claims priority, application Japan, May 14, 1973, 48-55418[U]
Int. Cl.² G11B *15/29*
U.S. Cl. 242—55.19 A **4 Claims**

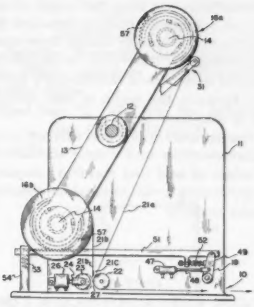


1. In an endless tape cartridge including a reel adapted for carrying an endless roll of tape, an upper casing, a lower casing having a shaft securely mounted thereon, and a pinch roller, said pinch roller having a center opening through which said shaft extends for rotatably mounting said pinch roller on said shaft, said pinch roller being adapted for rollable engagement with a capstan, said pinch roller being provided with an upper end face and a lower end face, the improvement for preventing wear of said pinch roller and shaft wherein each end face of said pinch roller is provided with an annular recess disposed concentrically with said shaft, each of said annular recesses being spaced from said center opening and having a bottom; and said upper casing is provided with an upper annular projection and said lower casing is provided with a lower annular projection, said upper annular projection extending into said upper annular recess without physically contacting said upper recess bottom, and said lower annular projection extending into said lower annular recess without physically contacting said lower recess bottom.

3,907,235
FILM UNWINDING AND SPLICING APPARATUS

Rene J. Gaubert, 4219 Oakmore Rd., Oakland, Calif. 94602

Division of Ser. No. 299,370, Oct. 20, 1972, Pat. No. 3,863,855. This application Aug. 9, 1974, Ser. No. 496,089
Int. Cl.² B65H *25/14, 25/20*
U.S. Cl. 242—57 **4 Claims**

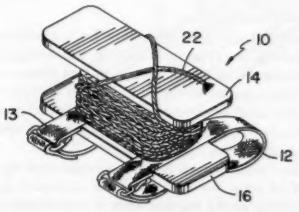


2. Means for sensing the complete unwinding of material from a roll of the same, the roll being formed of a central core with the material being wrapped thereon, a member having one end thereof adapted to engage and ride upon the periphery of the roll, mounting means for said member whereby said one end of of the same may move toward or away from the core of the roll, a second member movably carried by the first member, the second member having one end of the same adapted to engage one side surface of that portion of the material extending from the roll during unwinding of the same, means for urging the one of the first member in a direction toward the roll, means acting between the first and second member serving to urge the second member toward said portion of the material extending from the roll, and electrical contact means actuated by the second member responsive to movement of the same relative to the first member caused by complete unwinding of the material from the core.

3,907,236
DIVER'S LIFE LINE REEL

Dewey M. Sims, Jr., 1342 Windham Dr., Westland, Mich. 48185

Continuation-in-part of Ser. No. 275,769, July 27, 1972, abandoned. This application Sept. 13, 1974, Ser. No. 505,848
Int. Cl.² B65H *75/34*
U.S. Cl. 242—85.1 **9 Claims**



1. An underwater diver's life line reel comprising:
a pair of elongated flexible straps;
a first rectangular elongated flat member having end edges transverse to the direction of length of said member;
a second substantially rectangular elongated flat member parallel to and spaced from said first elongated member, said second elongated member having a pair of spaced apart recessed strap receiving means extending trans-

versely to the direction of length of said member for respectively receiving said straps, said straps adapted to be secured in a spaced apart relationship around the extremity of the diver;

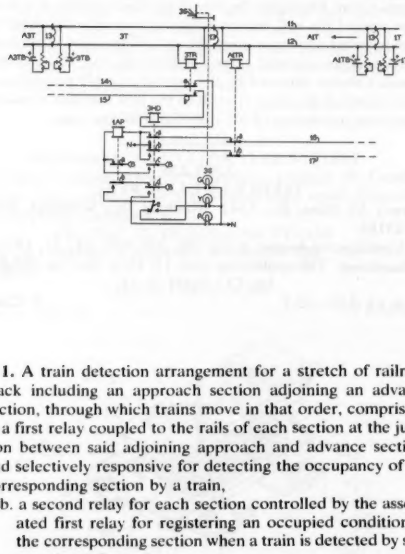
an interconnecting substantially thin rectangular flat core member connected orthogonal to each elongated flat member for maintaining said elongated members in a parallel spaced apart relationship, said member having a length substantially less than the length of said elongated members and positioned midway between the long sides of said members and equally distant from each end of said members having the difference in length between said core and said members is substantially greater than the difference between the width of said members and the thickness of said core; and

a length of line secured at one end thereof to said interconnecting core member and wound therearound, wherein said end edges of said first member cooperate with said line for preventing unintentional unwinding when said line is under tension.

3,907,237
CHECK-IN, CHECK-OUT TRACK CIRCUIT ARRANGEMENT

Crawford E. Staples, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 17, 1974, Ser. No. 470,802
Int. Cl.² B61L *23/14*
U.S. Cl. 246—34 A **19 Claims**



1. A train detection arrangement for a stretch of railroad track including an approach section adjoining an advance section, through which trains move in that order, comprising,

a. a first relay coupled to the rails of each section at the junction between said adjoining approach and advance sections and selectively responsive for detecting the occupancy of the corresponding section by a train,

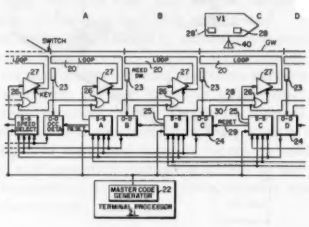
b. a second relay for each section controlled by the associated first relay for registering an occupied condition of the corresponding section when a train is detected by said associated first relay,

c. an occupancy registration clearing circuit network jointly controlled by an unoccupied condition contact of the approach section second relay and an occupied condition contact of the advance section second relay and coupled to said approach section second relay for retaining a train occupancy registration for said approach section, after a train clears that section, until that train is registered as occupying said advance section.

3,907,238
OCCUPANCY DETECTOR FOR VEHICLE CONTROL SYSTEMS

Henry C. Sibley, Adams Basin; John H. Auer, Jr., Fairport, and Willis R. Smith, Rochester, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Division of Ser. No. 344,681, March 26, 1973, which is a division of Ser. No. 152,845, June 14, 1971, Pat. No. 3,748,466. This application May 20, 1974, Ser. No. 471,390
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 R **7 Claims**



1. A vehicle control system for operating vehicles over a right-of-way divided into a plurality of zones and having control means for governing the operation of the vehicles in accordance with the traffic conditions communicated from the wayside to the vehicle wherein the improvement comprises:

a. means on the vehicle for demarcating ends thereof;

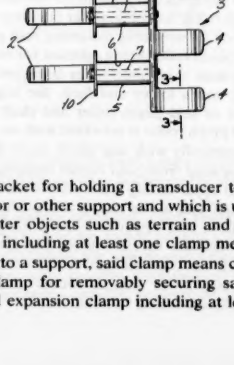
b. wayside marker means at an entering boundary of each zone responsive to the passage of each end of the vehicle for respectively assuming a first or second condition in accordance with the passage of an odd or even number of demarcating means respectively;

c. occupancy means for each zone responsive to its associated wayside marker for registering occupancy in accordance with said first condition until cancelled; said means, governing the occupany means, governed jointly by the first condition for the next two wayside markers in advance of the vehicle and a second condition for its associated marker for cancelling the occupancy indication.

3,907,239
BRACKET FOR HOLDING TRANSDUCER

Harold P. Ehrlich, Florissant, Mo., assignor to C. G. Manufacturing Co., Florissant, Mo.

Filed Jan. 21, 1974, Ser. No. 434,902
Int. Cl.² A47B *96/06*
U.S. Cl. 248—229 **10 Claims**



1. In a bracket for holding a transducer to the shaft for a trolling motor or other support and which is useful for detecting underwater objects such as terrain and location of fish, said bracket including at least one clamp means for securing said bracket to a support, said clamp means comprising a first expansion clamp for removably securing said bracket to a support, said expansion clamp including at least two pairs of

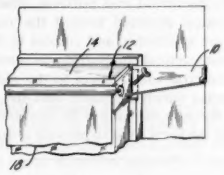
integral expansion grips vertically aligned, at least one fastening member extending substantially oppositely away from said first expansion clamp and designed for securing a transducer, said fastening member comprising a second expansion clamp, said second expansion clamp including a base member, a series of pairs of arcuately shaped expansion grips integrally extending from said base member, at least one spacer means arranged fixed intermediate each expansion grip of the first expansion clamp and the base member of the second clamp and providing clearance for a secured transducer away from its support, each spacer comprising a length of sleeve, a fastener arranged through each sleeve for holding to its ends the grips of the first expansion clamp and the base member of the second clamp, and each said fastener being seated within the base member to provide clearance for support of a transducer by its series of expansion grips.

3,907,240

MULTI-POSE SHADE, BLIND AND CURTAIN SUPPORT SYSTEM

Richard Belli, 152 Christie Ave., Clifton, N.J. 07011

Filed Oct. 24, 1974, Ser. No. 517,593
Int. Cl.² A47H *1/14*
U.S. Cl. 248—254 **2 Claims**



1. A multi-purpose shade, blind and curtain support system for windows, comprising:

a. a right-hand, single window bracket having means for securement within the upper right-hand corner of a window jamb, said bracket comprising:

i. means for securement of the right-hand end of the axial support member of a window shade roller;

ii. means for securement of the right-hand end of a Venetian blind head; and

iii. means for securement of the right-hand end of a curtain rod; and

b. a left-hand single window bracket having means for securement within the upper left hand corner of a window jamb, said bracket comprising:

i. means for securement of the left-hand end of the axial support member of a window shade roller;

ii. means for securement of the left-hand end of a Venetian blind head; and

iii. means for securement of the left-hand end of a curtain rod,

wherein said means for securement within said upper right and left corners of a window jamb comprise the combination of:

i. a U-shaped member having one flange for placement against a first edge of a window stop, said first edge being transverse to the plane of the window jamb;

ii. an L-shaped member having one flange for placement against a second edge of said window stop, said second edge being parallel to said first edge, said L-shaped member comprising means for movement relative to each of said left- and right-hand brackets, wherein said movement means comprises a threaded bolt extending through both said L-shaped member and each of said brackets, wherein said bolt may be manually turned in order to secure each of said brackets to the window stops of a window jamb; and

iii. means for mutually clamping said U- and L-shaped members against each window stop in order to secure the entire support system to the inside of the window jamb,

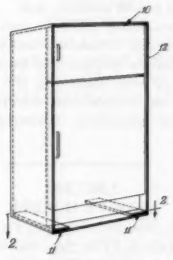
whereby said means for securement permits the ready manual detachable securement of the present support system to the window stops of a window jamb.

3,907,241

DISPOSABLE SKID

Howard M. Oglesby, Evansville, Ind., and Brian R. Smith, Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 7, 1973, Ser. No. 395,635
Int. Cl.² B65D *19/00*
U.S. Cl. 248—346 **10 Claims**



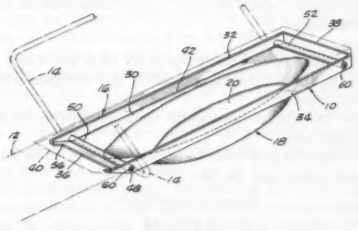
1. A disposable material handling support comprising: a sheet of corrugated disposable material folded and wrapped continuously into at least five substantially flat layers to define a generally parallelepiped runner; and a plurality of reinforcement channels formed of strong, rigid material embracing opposite folded edges of the sheet within the outermost layers for defining embedded reinforcement means at corners of the runner.

3,907,242

FIBERGLASS CANTILEVER STAND FOR DIVING BOARDS

Carl R. Meyer, 205 Palo Verde Dr., Brownsville, Tex. 78520

Continuation-in-part of Ser. No. 221,621, Jan. 28, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,369
Int. Cl.² A63B *5/10*
U.S. Cl. 248—346 **1 Claim**



1. A rigid one-piece molded cantilever stand formed from resin impregnated materials including cloth-like layers made from glass fibers for operatively mounting a diving board to a deck surrounding a swimming pool, comprising, in combination,

a base portion adapted to be installed in a fixed relationship near said pool, said base portion further including a planar base having a plurality of openings for receiving means for fastening said stand to said deck, and a rigid

upwardly directed continuous surface co-extending from said planar base and outwardly therefrom at preselected angles relative thereto, said planar base further having a curvilinear configuration with successive cross-sectional elements of said continuous surface above said planar base and parallel thereto forming successively larger curvilinear configurations;

a platform portion disposed on said base portion and adapted to receive said board in operative disposition, said platform portion comprising a horizontal planar surface co-extending from the upper edge of said continuous surface of said base portion, said platform portion having a rectilinear configuration with a vertically disposed rear wall, two vertically disposed side walls interconnected with said rear wall, and a front wall inclined upwardly and outwardly with respect to said base portion disposed between said side walls, the lowest region of said walls being integrally connected to the outer most edge of said horizontal planar surface; and

a tubular butt anchoring member and a tubular fulcrum supporting member extending transversely completely across said platform portion and through said side walls and disposed on and bonded to the upper side of said horizontal planar surface near said rear and front walls respectively for operatively mounting a diving board to said stand.

3,907,243

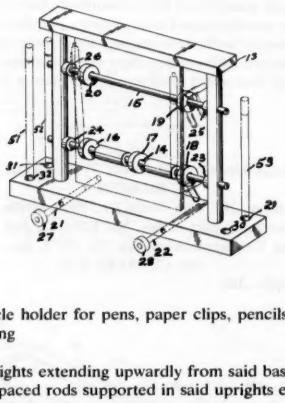
ARTICLE HOLDER

John P. Gidos, P.O. Box 205, Ludlow, Pa. 16333

Filed July 8, 1974, Ser. No. 486,337

Int. Cl.[2] A47B *97/04*

U.S. Cl. 248—441 **9 Claims**



1. An article holder for pens, paper clips, pencils and the like comprising

a base,

spaced uprights extending upwardly from said base,

vertically spaced rods supported in said uprights extending therebetween,

hollow cylindrical permanent magnets slidably supported on said rods,

and means on said base for supporting the lower end of a book, paper and the like.

3,907,244

TIE ROD WITH EXPANSIBLE CONE SEAL MEMBERS

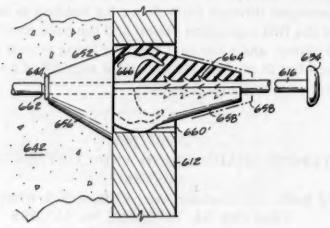
Clyde H. Abbott, 1085-B Oak Hill Rd., Lafayette, Calif. 94549

Filed May 4, 1973, Ser. No. 357,465

Int. Cl. E04g *17/08*

U.S. Cl. 249—40 **11 Claims**

1. A tie rod and cone assembly for use in temporarily positioning a pair of spaced-apart wall forms, the tie rod and cone assembly comprising a rod in the form of a generally elongated member defining an axis each end of which is adapted to project through a respective bore in the spaced-apart wall forms and a cone member of circular configuration positioned on each end of the rod and adapted to be positioned at least partially within a respective bore and normally in concentric spaced relation with a respective bore and defining a first outer diameter, said cone members being of a deformable material so as to be adapted to be radially deformed to a second diameter greater than said first diameter and into sealing engagement with the interior of a respective bore and retainer means for holding the cone members in sealing engagement with a respective bore whereby leakage from the



forms is prevented, each cone member being a generally elongated member having oppositely directed frustoconical end portions, and a generally cylindrical center portion intermediate said frustoconical end portions wherein the frustoconical end portion directed toward the rod end and the center portion are symmetric and coaxial to the rod axis and wherein said frustoconical end portion directed away from the rod end is asymmetric with respect to the rod axis and has a maximum diameter which is greater than the diameter of the center portion thereby defining a lip adapted for contacting the inner wall of the form so as to provide a spreader function.

3,907,245

PLASTIC, TWO PIECE CANDLE MOLD WITH INTEGRAL FASTENING MEANS

Joseph Linder, Cincinnati, Ohio, assignor to Fibre Glass-Evercoat Co., Inc., Cincinnati, Ohio

Continuation of Ser. No. 284,640, Aug. 29, 1972, abandoned. This application June 10, 1974, Ser. No. 477,693

Int. Cl.[2] B29C *1/00*

U.S. Cl. 249—94 **25 Claims**

1. A bipart mold for producing molded objects from a fluid molding material such as wax, plaster, gelatin and the like which is settable to a solid condition; said mold comprising two registerable, separable, plastic, one-piece mold sections having mating registerable mold cavities therein which define a single enclosed mold cavity when the sections are operatively assembled together, said mold sections having a filling gate in communication with the mold cavity; a marginal, substantially planar portion on each mold section at the top, bottom and sides of the cavity and defining a mold parting area having substantially flat peripheral edges, means on said planar portions for aligning and sealing the mold sections

relative to one another when the sections are operatively assembled; a plurality of spaced apart, registerable, interengageable, cooperative, integral mold clamping means on the peripheral edges of said sections for releasably holding the mold sections in substantial mutual contact at said parting areas, and said mold sections each having integral enlarged base portions thereon for supporting the mold in upright position to enable filling of the mold cavity through the filling gate when the mold sections are held in operative assembled relationship by said clamping means.

3,907,246

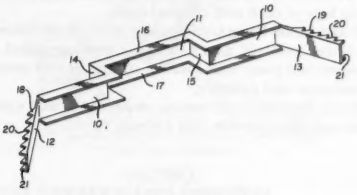
SELF WEDGING DEVICES FOR SIDE BOARDS IN INGOT MOLDS

James B. LaBate, Chippewa Park Rd., Beaver Falls, Pa. 15010

Filed Nov. 1, 1973, Ser. No. 411,794The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl. B22d *7/10*

U.S. Cl. 249—202 **2 Claims**



1. Self wedging devices for side boards in a rectangular configuration in ingot molds comprising a pair of elongated metal members, sidewardly offset parallel sections in each of said elongated metal members inwardly from the ends thereof and oppositely disposed angularly positioned distortable end sections on each of said elongated metal members, sharp, pointed portions extending outwardly on each of said end sections and arranged to be embedded in said side boards when said elongated metal members are forcibly positioned therebetween with said sidewardly offset sections engaging additional side boards positioned in said ingot mold so as to hold the same in position therein.

3,907,247

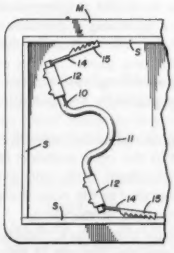
HOLDING DEVICE FOR SIDE BOARDS IN INGOT MOLDS

James B. LaBate, Chippewa Park Rd., Beaver Falls, Pa. 15010

Filed Jan. 21, 1974, Ser. No. 435,299The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² B22D *7/10*

U.S. Cl. 249—202 **6 Claims**



1. Holding devices for side boards in a rectangular configuration in ingot molds comprising a pair of rod-like metal members, U-shaped tensioning configurations in each of said rod-like metal members inwardly from the ends thereof, metal clips attached to the end of said rod-like metal members, perpendicular points on said clips, outwardly extending distortable sections on said clips, sharp pointed portions extending outwardly on each of said distortable sections, said pointed portions arranged to be embedded in oppositely disposed side boards when said rod-like metal members are forcibly positioned therebetween with said points on said clips engaging other side boards positioned in said ingot mold so as to hold the same in position therein.

3,907,248

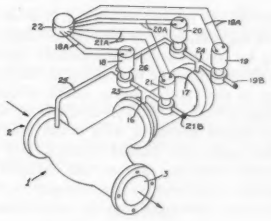
STOPCOCKS

Maxwell Glover Coulbeck, Christchurch, New Zealand, assignor to M. G. Coulbeck Limited, Wellington, New Zealand

Filed July 20, 1973, Ser. No. 380,947

Int. Cl.² F16K *31/383, 31/02*

U.S. Cl. 251—30 **3 Claims**



1. A valve control assembly having inlet and outlet conduits for the passage of fluids, a valve seat between the inlet and outlet conduits, a valve movable onto or away from the valve seat, and a valve stem secured to said seat; the improvement comprising:

a. a cylindrical chamber separated from the valve conduits and in axial alignment with the valve stem, and a piston within the chamber secured to the valve stem for moving the valve onto or away from the valve seat;

b. a first control means for closing the valve including a first control conduit connected between the inlet conduit and an opening into an outer side of said piston for moving the piston, the valve stem, and the valve toward the valve seat to close the valve, and an electric solenoid operated valve connected in series with the first control conduit for operating the first control means;

c. a second control means for opening the valve including a second control conduit connected between the inlet conduit and an opening into an inner side of said piston for moving the piston, the valve stem, and the valve away from the valve seat to open the valve, and an electric solenoid operated valve connected in series with the second control conduit for operating the second control means;

d. a first discharge valve, operated by an electric solenoid, connected to the second control conduit for discharging fluid from the cylinder when the valve is being closed; and

e. a second discharge valve, operated by an electric solenoid, connected to the first control conduit for discharging fluid from the cylinder when the valve is being opened.

3,907,249

VALVE DEVICE FOR RESTRICTING THE FLOW OF A LIQUID BY A HELICAL FLOW PASSAGE

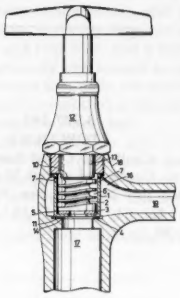
Bengt Arne Persson, Djursholm, Sweden, assignor to B A Installationsutveckling AB, Djursholm, Sweden

Filed Mar. 15, 1974, Ser. No. 451,657

Claims priority, application Sweden, Mar. 15, 1973, 7303659

Int. Cl.[2] F16K 47/00

U.S. Cl. 251—126 6 Claims



1. A valve device for regulating the flow of a liquid in a valve housing supporting a cap-member in which a valve-stem is journalled for axially adjusting a closure member with respect to a valve seating, the flow being restricted by a helical flow passage in the valve housing, characterized in that the helical passage is located in a cylindrical body surrounded by a cylindrical sleeve provided with outlet apertures for the liquid having passed the helical passage, said sleeve being fixedly mounted with one end portion engaged by the valve housing and the other end portion engaged by the cap-member and in coaxial relationship to the valve-stem.

3,907,250

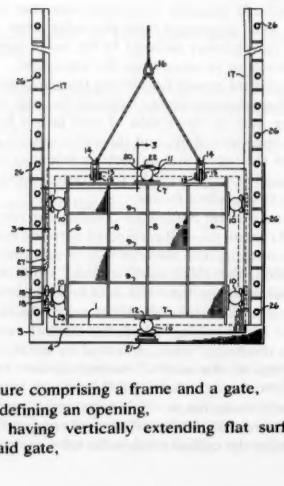
SLUICE GATE

John J. Kane, 2824 Bement St., Erie, Pa. 16506

Filed Aug. 2, 1973, Ser. No. 384,912

Int. Cl.[2] F16K 51/00

U.S. Cl. 251—147 5 Claims



1. A closure comprising a frame and a gate,

said frame defining an opening,

said frame having vertically extending flat surface facing toward said gate,

first reaction means on said frame,

said first reaction means comprising two vertically extending channel track members channel shaped in cross section, spaced outwardly from said flat surface and the legs of one said channel extending toward the other said channel defining a space between said track members at each side of said opening,

said channel track members extending upwardly above said opening a distance substantially equal to the height of said opening, to receive said gate in open position,

sealing means on said gate adapted to cooperate with said flat surface on said frame to form a seal,

spaced actuators attached to each side of said gate,

each said actuator comprising a hydraulic cylinder fixed to said gate and a piston reciprocatably received in each said cylinder,

each said cylinder having an opening in a side thereof exposing a portion of said piston,

second reaction means comprising bar means extending through the said opening in each said cylinder and fixed to said piston,

and a roller fixed to each of said bar means disposed between said legs of each said channel track,

each said piston being confined in a said cylinder allowing said cylinder and said gate to move a predetermined distance toward and away from said flat surface as said piston reciprocates in said cylinder,

hydraulic fluid pressure means connected to said cylinder for moving said piston in said cylinder.

3,907,251

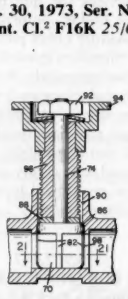
EXPANSIBLE PLUG VALVE

Wilfred J. Grenier, Central Tree Rd., Rutland, Mass. 01543

Filed Aug. 30, 1973, Ser. No. 392,967

Int. Cl.[2] F16K 25/00

U.S. Cl. 251—189 8 Claims



1. A valve comprising a valve housing having a flow passage,

a valve chamber extending transversely to, and intersecting said flow passage,

a valve element movable in the chamber to open and close the flow passage, a stem for moving said valve element, said valve element comprising a metallic member including a side wall and means connecting the metallic element to said valve stem,

means forming spaced longitudinal slots in said side wall, said slots extending generally transversely with respect to the flow passage,

and elastomeric material in said metallic member, said elastomeric material in the open position of said valve normally filling said longitudinal slots, and extending exteriorly of said metallic member at the ends thereof opposite the stem and on the same side of the stem,

whereby the exterior elastomeric material at the end opposite said stem contacts the bottom of the valve chamber when the valve element is moved to close the valve, exerting pressure thereon, and on the elastomeric material in the metallic member, said elastomeric material thereby being forced outwardly relative to said slots in contact with the walls of said valve chamber, and separate externally adjust-

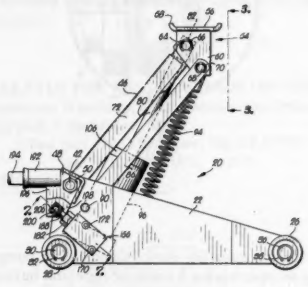
able expanding means acting on the elastomeric material at the stem end thereof to continuously expand the elastomeric material into contact with the valve chamber wall and to seal the valve element against leaking in the valve stem area.

3,907,252

LIGHTWEIGHT SERVICE JACK

Gilbert W. Gaarder, St. Joseph, Mo., assignor to Gray Manufacturing Company, Inc., St. Joseph, Mo.

Filed Apr. 29, 1974, Ser. No. 464,923
Int. Cl. B66f *3/24*
U.S. Cl. 254—8 B **32 Claims**



1. A jack for raising objects, comprising:
a frame;
a supply of hydraulic fluid;
a hydraulic cylinder having a pressure chamber and an axially reciprocable ram which extends outwardly therefrom and reciprocates in response to hydraulic pressure within said pressure chamber;
selectively actuatable pump-means located adjacent said cylinder in side-by-side relationship therewith and operatively connected to said supply of hydraulic fluid;
an elongated, axially bored trunnion operatively connected adjacent the ends thereof to said cylinder and pump means respectively, said trunnion being rotatably supported by said frame to define a pivot axis for said cylinder,
there being hydraulic fluid passageways in said cylinder communicating said pressure chamber and trunnion bore, the latter and said fluid passageways communicating said pump means and pressure chamber, said pump means being operable to draw hydraulic fluid from said supply thereof and deliver the same under pressure through said trunnion bore and fluid passageways to said pressure chamber;
lift structure including a lift arm pivotally secured to said frame, and object engaging structure on said lift arm,
said ram being operatively connected to said lift structure at a point on the latter spaced from the pivotal securement thereof to effect raising and lowering of said lift structure as said ram reciprocates; and
selectively actuatable release mechanism operatively connected to said cylinder for relieving the hydraulic pressure within said pressure chamber to permit lowering of said jack.

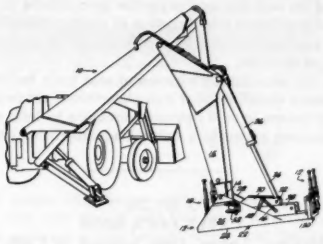
3,907,253

PIPE GUIDE MEANS FOR A ROD AND PIPE PUSHER

William O. Schosek, Box 3626, North Fort Myers, Fla. 33903

Filed June 24, 1974, Ser. No. 482,275
Int. Cl. E21b *19/00*
U.S. Cl. 254—29 R **9 Claims**

1. A pipe guide means for attachment to a rod and pipe pusher of the type which is used to push a rod or pipe under finished surfaces such as a driveway, street, etc., the pusher being reversably actuated by a conventional power means while positioned in an operating trench on one side of the finished surface with a target trench on the opposed side thereof, the rod or pipe being in coupled sections, said guide means comprising;
a. front and rear guide assemblies attached relative to the front and rear ends of the rod and pipe pusher, each including,
1 an upper roller provided with an annular groove,



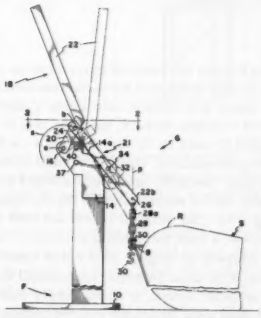
2. a lower roller provided with an annular groove, said upper and lower annular grooves being laterally rounded in cross sections to generally conform with the radius of a rod or pipe passing therebetween;
b. means to journal said upper and lower rollers;
c. means to maintain said upper and lower rollers in alignment in a generally vertical plane;
d. means to adjust said lower roller upwardly and downwardly in said vertical plane;
e. compression means to normally maintain said top roller in a predetermined position and permitting a limited degree of upward movement thereof when a rod or pipe coupler passes therebetween.

3,907,254

LIFTING APPARATUS

Thomas J. Richards, 3070 King Rd., Saginaw, Mich. 48601

Filed Mar. 22, 1973, Ser. No. 343,638
Int. Cl.[2] B66F *3/00*
U.S. Cl. 254—131 **14 Claims**



1. Apparatus for lifting and supporting a load, such as a portion of a snowmobile and the like comprising:
a frame;
actuating lever means pivotally mounted on said frame for pivotal movement about an axis between generally forward and rearward positions;
load supporting means having one end pivotally coupled to said lever means for swinging movement therewith in an orbital path about said axis between forward and rear-

ward positions and for swinging movement relative thereto, said support means having a free end for supporting said load movable between lowered and raised positions as said one end moves between said forward and rearward positions;

means for guiding the front to rear and swinging movement of a portion of said support means relative to said frame and said lever means as said lever means and said support means swing to guide said free end in a substantially linear, vertical path of travel;

said support means being mounted such that the load exerted on said free end urges the lever means in said forward position in one direction of rotation about said first axis and in said rearward position in an opposite direction of rotation; and

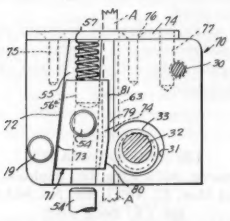
means for interrupting rotation of said lever means in said opposite direction after a predetermined rotation of said lever means in said opposite direction to lock said load supporting means in a stable load supporting position.

3,907,255

CABLE LOCK SHOE

Robert McElroy, Lisbon, Ohio, assignor to Cable Climber Safety Devices, Incorporated, Lisbon, Ohio

Filed Apr. 4, 1974, Ser. No. 458,001
Int. Cl.² A62B 1/14
U.S. Cl. 254—156 **2 Claims**



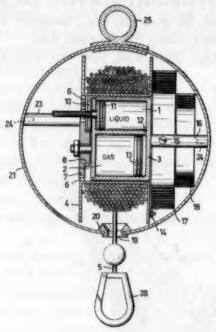
1. In an electric hoist for vertical movement on a stationary cable, a block on said hoist and movable therewith, a vertical recess in said block and having said cable extending therethrough adjacent one side thereof, said one side of said recess extending parallel to said cable and having a cable receiving groove extending therealong, the side of said recess opposite said groove sloping inwardly upwardly toward said cable, a generally circular recess formed in said block adjacent to and communicating with said vertical recess on said one side of said vertical recess, a cam mounted for rotation in said circular recess and adapted to engage said cable upon rotation of said cam, a cable lock shoe mounted for vertical sliding movement in said vertical recess, a downwardly and outwardly sloping wall on said shoe arranged in confronting relation to said inwardly sloping side of said vertical recess to move said shoe laterally in a cable clamping direction as said shoe moves upwardly in said recess, a groove formed in the side of said shoe toward said cable for engaging said cable, said side of said shoe toward said cable extending vertically from its upper end to a point intermediate its upper and lower end and then extending parallel to said downwardly and outwardly sloping wall for the rest of its length whereby the shoe does not bind against said cam when moving upwardly in a cable clamping direction.

3,907,256

DEVICE FOR LOWERING PERSONS AND LOADS

Kauko Valdemar Kankkunen, Leppisaarentie 6 F, 00830 Helsinki 83, Finland

Filed Apr. 3, 1974, Ser. No. 457,716
Int. Cl.² A62B 1/08
U.S. Cl. 254—160 **6 Claims**



1. A device for lowering persons and loads, comprising a case having an opening for a cable or rope and having means for fastening the device to a stationary support;

a cable drum rotatably mounted within said case;

a cable wound on said drum and unwindable therefrom and having means for fastening the free end of the cable to the person or load to be lowered;

means for rewinding the cable on said drum after the cable has been pulled off said drum;

a first cylinder filled with a liquid and having a movable piston with a rod protruding from the cylinder and provided with a thread;

a second cylinder filled with a gas and having a movable piston;

nozzle means connecting said first cylinder with said second cylinder,

means transferring rotary movement of said drum into movement of the piston within said first cylinder;

an additional bearing driving said rotary movement transferring means; and

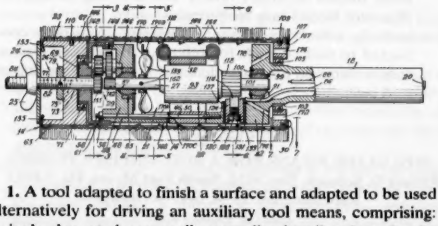
means for selectively coupling said cable drum into driving engagement with said additional bearing.

3,907,257

MULTIPURPOSE HAND TOOL

Edward R. Drzewiecki, 1751 E. 93rd St., Chicago, Ill. 60617

Filed Aug. 15, 1974, Ser. No. 497,591
Int. Cl.² B24B 23/00
U.S. Cl. 51—170 PT **10 Claims**



1. A tool adapted to finish a surface and adapted to be used alternatively for driving an auxiliary tool means, comprising: a single elongated rearwardly-extending handle adapted to be grasped by a hand of the user to support completely the tool and having front and rear end portions;

frame means fixed to and axially-aligned with said front end portion of said handle;

a tubular housing surrounding and axially aligned with said frame, said housing having tool means on the outer surface thereof for finishing the surface;

means for mounting rotatably said housing on said frame means to rotate axially relative thereto;

driving means mounted on said frame means substantially within said tubular housing for rotating axially said housing relative to said frame means, said driving means having a forwardly-extending output shaft;

means for connecting drivingly an intermediate portion of said output shaft to said housing means; and

a free distal end portion of said shaft extending forwardly for receiving directly and for driving directly the auxiliary tool means.

3,907,258

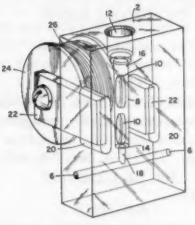
APPARATUS FOR MIXING FLUIDS ON STREAM

Fred F. Spaziani, Winthrop, Mass., assignor to Orion Research Incorporated, Cambridge, Mass.

Filed Nov. 12, 1973, Ser. No. 414,779

Int. Cl. B01f *5/00, 13/08*

U.S. Cl. 259—4 **6 Claims**



1. An apparatus for agitating and/or mixing one or more fluids on stream comprising:

an elongated conduit of substantially non-magnetic material;

at least one elongated element permanently magnetized in its longitudinal direction for stirring said fluids and disposed in at least a portion of said conduit, said element being substantially longer than the maximum cross-sectional inner width of said portion of conduit, and having a maximum cross-sectional width which is less than the minimum cross-sectional inner width of said portion of conduit; and

means for producing an alternating magnetic field through said portion of conduit.

3,907,259

EXTRUSION MACHINE

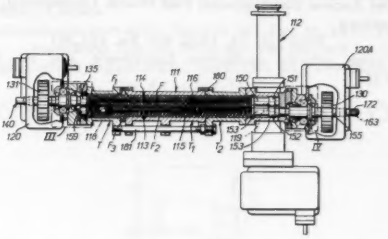
Daniel Jules Leclercq, Paris, France, assignor to Societe des Establissements Andouart, Bezons, France

Filed Jan. 10, 1973, Ser. No. 322,275

Int. Cl.² B29B *1/10*

U.S. Cl. 259—192 **16 Claims**

1. An extrusion machine comprising a pair of screws of opposite pitch having axes thereof disposed in generally parallel relationship, a housing within which said screws are disposed, inlet means through which material is introduced into said housing, outlet means through which material exists from said housing, means for rotating said screws in opposite directions such that the opposite pitch thereof delivers material in a direction from said inlet means toward said outlet means and establishes reaction forces in a direction from said outlet means toward said inlet means, said screws each having axially opposite ends, means at one end of a first of said screws axially compressively resisting axial movement of said first screw in a direction away from said outlet means as a result of the reaction forces imposed thereupon, means at one end of a second of said screws axially tensionally resisting axial movement of said second screw in a direction away from said outlet means as a result of the reaction forces imposed thereupon



equalized stress distribution of said reaction forces is achieved, said one end of said first screw is axially remote from said one end of said second screw, and the remaining ends of said first and second screws are also axially remote from each other.

3,907,260

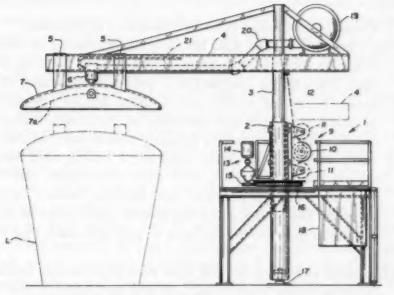
APPARATUS AND METHOD FOR PREHEATING REFRACTORY LINED LADLES

Vincent C. Leatherby, Glenshaw, Pa., assignor to Fuel Equipment Co., Inc., Pittsburgh, Pa.

Filed Jan. 23, 1974, Ser. No. 435,941

Int. Cl.² F27D *1/16*

U.S. Cl. 266—1 R **2 Claims**



1. Apparatus for uniformly preheating the refractory lining of a stationary, substantially cylindrical ladle and the like prior to pouring therein of molten metal, comprising a cover with a refractory lining having an inner concave surface confronting and adapted for covering the mouth portion of said ladle, a burner mounted centrally of said cover and axially of said ladle so as to project a flame from the interior and axially of said lining of said ladle to provide substantially uniform application of radiant heat to said refractory lining of said ladle, a remote source of fuel for said burner, power driven means for selectively moving said cover either vertically or horizontally relative to said mouth portion of said ladle, a vertical post pivotally supporting a horizontally rotatable boom supporting said cover and said burner, said power driven means including reversible drive means for selectively sliding said boom in either direction vertically of said post or for turning it about the axis of said post to selectively control the position of said cover vertically, to provide a flue spacing, and horizontally relative to the mouth portion of said ladle, and a blower mounted on said boom in an opposite direction from said post

relative to said cover for blowing air for combustion through said burner.

3,907,261

SHUT-DOWN DISCHARGE APPARATUS

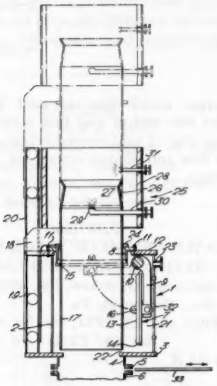
Edouard Legille, Luxembourg, Luxemburg, assignor to S.A. Des Anciens Etablissements Paul Wurth, Luxembourg, Luxemburg

Filed July 24, 1974, Ser. No. 491,351

Claims priority, application Luxemburg, July 30, 1973, 68125

Int. Cl.[2] C21B *7/00*

U.S. Cl. 266—17 **10 Claims**



1. Gaseous discharge control apparatus comprising:

valve housing means, said housing means having an axis and first and second open ends, a first of said housing means open ends being coupled to a pressurized source of gas; means mounted within said housing means intermediate of said open ends for defining an apertured valve seat axially aligned with said housing means second end;

a valve member pivotally supported within said housing means for cooperation with said valve seat, said valve member opening towards said housing means first end whereby the pressure of the source gas assists in sealing the valve member to the seat to prevent discharge of the gas;

elongated vent pipe means, said vent pipe means having an external shape commensurate with the shape of said valve seat and having a smaller cross-sectional area than said valve seat; and

means mounting said vent pipe means from said valve housing means for movement along said axis whereby a first end of said vent pipe means may be inserted through the valve seat when said valve member is in the open position to protect said valve seat and said valve member from direct impingement of the gas being discharged.

3,907,262

INSTALLATION FOR THE TREATMENT OF MINERALS ON A CONTINUOUS GRATE

Edouard Bonnaure, Le Vesinet, France, assignor to Creusot-Loire Entreprises, Paris, France

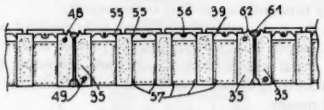
Filed Apr. 9, 1973, Ser. No. 349,044

Claims priority, application France, Feb. 17, 1972, 72.17621

Int. Cl.[2] F27B *19/02*

U.S. Cl. 266—21 **4 Claims**

1. An installation for the hot gaseous-flow treatment of pelletized minerals, employing a circular continuous grate formed by a series of cars and mechanisms for driving the cars and comprising a charging zone, at least one treatment station in each of which the grate passes between fixed gastight hoods, one upper and one lower, a discharge zone and neutral zones and cooling zones, the frames of the cars including water cooling circuit means and lateral gastight sealing means between the movable cars and the fixed upper and lower



hoods, said sealing means including water seals arranged outside the gas flow path, the cars carrying blades which move with them and dip into fixed troughs filled with water and closed at their ends by flexible lips enabling the car blades to pass through, the cars and their grate-supporting cross-beams being clad with an inert insulating refractory layer and means for providing gastight sealing between two successive cars before approach to the charging station.

3,907,263

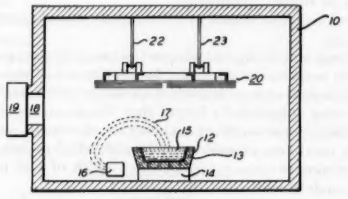
CONDENSATE COLLECTION MEANS

George R. Spies, Jr., Alamo, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 23, 1974, Ser. No. 463,230

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 R **8 Claims**



1. In a furnace for processing materials subject to vaporization, and including a condensate collecting means comprising a surface adapted for positioning in the path of vapor, and at least one mesh structure positioned adjacent said surface and substantially coextensive therewith for positioning in the path of vapor, and support means within said furnace for engaging and supporting said condensate collecting means, wherein the improvement comprises;

a. a substantially flat, rectangular collector plate;

b. a stiffening frame fastened to the surface of said plate which is not in the path of vapor and substantially coextensive with said plate;

c. positioning means fastened to said stiffening frame and adapted to cooperate with said furnace support means; and

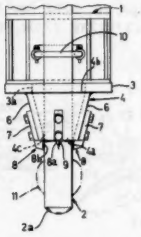
d. a substantially flat mesh structure fastened to the surface of said plate which is in the path of vapor and substantially coextensive therewith.

3,907,264

MEANS FOR CLEANING BLOWING NOZZLES IN STEEL PRODUCTION

Renè Desaar, rue Michel Body, 67, B.4330 Grace-Hollogne, Belgium

Filed Dec. 21, 1973, Ser. No. 427,260
Claims priority, application Belgium, Jan. 22, 1973, 43986
Int. Cl.[2] C21C 7/00
U.S. Cl. 266—34 LM 20 Claims



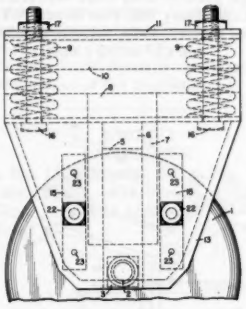
1. In combination with a container for producing steel a support structure mounted above the container, a blowing nozzle mounted for vertical movement on and relative to said support structure, a winch on said support structure for raising and lowering said nozzle, a fixed guide member carried by said support structure for guiding the end of the nozzle in its downward movement, and scraping means mounted on said guide member and supporting said blowing nozzle for scraping at least a part of the outer surface of the nozzle when said nozzle is raised from a working position inside said container to a rest position.

3,907,265

UNIVERSAL WHEEL AND SPRING UNIT

Ralph L. Hustead, R.D. No. 2, Box 127, Uniontown, Pa. 15401

Filed Mar. 12, 1974, Ser. No. 450,479
Int. Cl.[2] B60G 11/16
U.S. Cl. 267—60 7 Claims



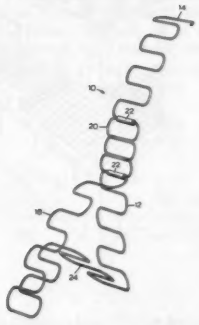
1. A spring and wheel unit comprising a housing having a top load-bearing plate and a pair of side walls extending downwardly from its opposite sides, a yoke straddled by said housing, the yoke having a top plate and a pair of side members extending downwardly from its opposite sides, guide means secured to said housing side walls and holding the yoke upright with its top plate spaced below the housing top plate, the yoke being movable vertically in said housing relative to said guide means, a wheel rotatably mounted in the yoke between said side members and extending below them, vertical coil springs above the wheel disposed between said top plates for supporting the housing from the yoke, and means limiting the distance said top plates can move vertically away from each other.

3,907,266

FURNITURE SPRING

Roy Michio Sano, Whitby, and Fredolin Edward Kunkel, Oshawa, both of Canada, assignors to Sklar Furniture Limited, Whitby, Canada

Continuation-in-part of Ser. No. 411,481, Oct. 31, 1973. This application July 19, 1974, Ser. No. 490,042
Claims priority, application Canada, Oct. 24, 1973, 184094
Int. Cl.[2] F16F 3/02
U.S. Cl. 267—102 1 Claim



1. In an upholstered furniture seating article having a frame including upper and lower backing rails, the improvement of an upholstery spring comprising an elongated body of flat spring material formed to provide a first longitudinally extending portion having a first end secured to said upper backing rail and a second end secured to said lower backing rail, said first portion extending in a first arc of curvature between said first and second secured ends to form a back support spring, a second portion having a length which is less than the length of the first portion and having an inner end connected to said first portion at a point spaced above said second end of said first portion, said second portion projecting outwardly and downwardly from its connection with said first portion in a second arc of curvature in the direction of said second end and having an outer end disposed in a spaced relationship with respect to said second end of said first portion to provide a lower back support spring projecting in the direction of said second arc of curvature, a third portion having a length which is greater than the distance between the outer end of the second portion and said second end of said first portion, said third portion extending between said outer end of said second portion and said second end of said first portion in an inwardly directed underlying relationship with respect to said first and second portions whereby said third portion serves to resiliently resist movement of said second portion towards said first portion.

3,907,267

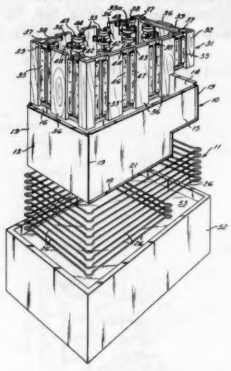
APPARATUS FOR ASSEMBLY OF EVAPORATOR TUBING TO LINER

Leslie N. Griffiths, Tarvin, England, assignor to Kelvinator, Inc., Grand Rapids, Mich.

Division of Ser. No. 203,590, Dec. 1, 1971, Pat. No. 3,799,831. This application Nov. 23, 1973, Ser. No. 418,245
Int. Cl.[2] B25B 11/00
U.S. Cl. 269—8 9 Claims

1. A fixture for assembling steel refrigeration tubing to the walls of a boxlike liner of a refrigeration apparatus comprising a rectangular liner surrounding a nonmagnetic rectangular male support structure, said support structure being adapted to be inserted in and removed from the liner, said support

structure defining at least four sidewalls having exterior dimensions slightly less than the interior dimensions of the liner walls to provide a slight working clearance for facilitating the positioning of the support structure in the liner, said support structure including means to mount magnets thereon, a plurality of magnets supported on a plurality of said sidewalls of said support structure by said mounting means, said mounting



means being adapted to hold said magnets in parallel relation to the walls of said liner, a plurality of interconnected lengths of steel evaporator tubing on a plurality of exterior faces of the liner associated with the sidewalls of said support structure on which said magnets are supported, said magnets temporarily holding said steel evaporator tubing in intimate continuous contact with the exterior faces of the liner.

3,907,268

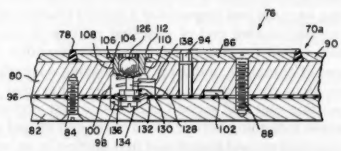
VALVE MEANS FOR VACUUM HOLDING DEVICE

Thomas F. Hale, P.O. Box 15, New Albany, Ind. 47150

Filed Mar. 29, 1974, Ser. No. 456,060

Int. Cl.[2] B25B *11/00*

U.S. Cl. 269—21 **27 Claims**



1. In a device for holding items comprising support means upon which items are held, the improvement comprising vacuum means for holding items to the support means, said vacuum means including a vacuum source, at least one vacuum cell plate mounted on said support means, said cell plate providing a front surface against which such items are held, said cell plate providing a plurality of cell areas in said front surface, sealing means extending about each cell area, and conduit means for connecting said cell areas to said vacuum source, said conduit means including, for each cell area, valve means, each said valve means including means providing a valve passageway having a first valve seat therein, and a valve member movable against said first valve seat to close said passageway, thereby closing its associated cell area to said vacuum source, and actuating means for determining when its associated cell area is completely covered by an item and opening said cell area to said vacuum source only when it is completely covered by an item, said actuating means including means for holding said valve member away from said first valve seat and then disengaging said valve member for movement against said first valve seat solely by the movement of air from said cell area when said cell area is not completely covered such that a vacuum can form therein.

3,907,269

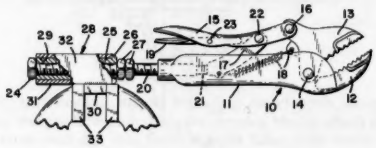
ROTATING LOCKING WRENCH HOLDER

Arthur D. Baker, Jr., Karnes City, Tex., assignor to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Apr. 18, 1974, Ser. No. 461,901

Int. Cl.[2] B23K *37/04*; **B23Q** *3/02*

U.S. Cl. 269—55 **2 Claims**



1. In a locking wrench comprising, a main handle, a relatively stationary jaw on one end of said main handle, a cooperating relatively movable jaw pivotally mounted on said main handle, a locking handle pivotally connected to said relatively movable jaw, a lever having one end pivotally mounted on said locking handle, and an elongated adjustment screw extending longitudinally of said main handle and having an inner end in abutting engagement with the other end of said lever; the combination of supporting means comprising, a bushing mounted on said adjustment screw longitudinally outwardly of said main handle, a cross-sectionally rectangular mounting body having an opening therethrough snugly journaling said bushing, and a mounting lug on said body and extending transversely thereof laterally outwardly with respect to opposite sides of said body, said lug having opposed surfaces disposed to be clamped between the jaws of a vise.

3,907,270

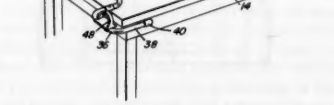
PORTABLE EXAMINING UNIT WITH STIRRUPS

Philomine A. Ezzo, Henry Hill, Port Henry, N.Y. 12974

Filed Dec. 17, 1974, Ser. No. 533,540

Int. Cl.[2] A61G *13/00*

U.S. Cl. 269—328 **7 Claims**

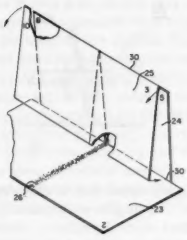


1. In combination, a panel member including long opposite side edges and short opposite end edges, a generally U-shaped frame including a pair of generally parallel legs interconnected at one pair of corresponding ends by means of a bight portion extending and secured therebetween, the other pair of ends of said legs including means defining foot rest portions, means pivotally supporting said bight portion from one end edge portion of said panel member for oscillation of said bight portion about an axis extending transversely of said panel member and lengthwise of said bight portion.

3,907,271
STEP-DOWN BOOKLET

Randolph S. Lyon, Jr., Westport, Conn., assignor to Kurt H. Volk, Inc., Milford, Conn.

Filed Jan. 25, 1972, Ser. No. 220,110
Int. Cl.² B41L *43/12*
U.S. Cl. 270—37 **3 Claims**



1. The method of making a step-down booklet from a preprinted web which comprises

a. perforating said web along transverse lines corresponding to the head and foot of the sheets comprising the booklet pages,

b. die cutting the sheets inside of and parallel to the opposite longitudinal edges of the web between the transverse perforations along lines corresponding to the margins of the booklet pages, where the internal booklet pages are of a non-uniform width,

c. removing those marginal portions of each sheet at the longitudinal edges of the web which are defined by the die cut lines along the opposite margins of the pages comprising the sheets, and the transverse perforation lines,

d. folding said sheets along said perforated lines to a superposed configuration whereby said sheet comprising the adjacent centerfold pages are the opposingly outward facing sheets,

e. binding the superposed sheets together along a line inside of and parallel to the longitudinal margins of said sheets to form a booklet backbone,

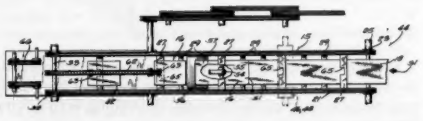
f. folding the superposed sheets along the bound backbone whereby the adjacent centerfold pages are placed in an adjacent overlying configuration, and

g. separating the bound sheets along the perforated lines at the head and foot of the booklet.

3,907,272
PAD FOLDER

Curt G. Joa, Box 1121, Boynton Beach, Fla. 33435

Filed Feb. 4, 1974, Ser. No. 439,484
Int. Cl.² B65H *43/00*
U.S. Cl. 270—61 R **9 Claims**

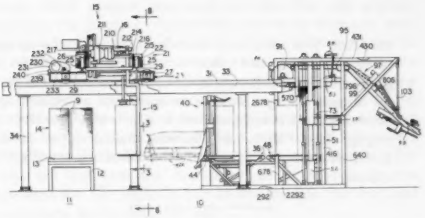


8. Pad folding apparatus comprising a set of coacting conveyors having substantially parallel runs between which a continuous strip of pad stock is fed, said conveyors having complementary cross bars which clamp the continuous pad stock therebetween as the conveyors move along said parallel runs, pad severing means for severing said continuous pad strip into discrete pad lengths with the said cross bars being disposed intermediate the length of said discrete pads, pad folding means for folding leading portions of said pads ahead of said cross bars over said cross bars, said cross bars having notches in their leading edges, another set of conveyors beyond the point where the pad is folded over the notched cross bar and which move at a faster speed than the conveyor set first mentioned, one of said second set of conveyors being provided with a series of clamp blocks which engage the leading edges of the folded pads through the notches in the cross bars whereby to clamp said pads to said second set of conveyors independently of the cross bar and extract the pads from the cross bars by reason of the faster speed of the second set of conveyors.

3,907,273
MACHINE FOR FEEDING STACKED ARTICLES

Kenneth R. Runyan, Dayton; Quentin E. Honnert, Cincinnati, and Ronald H. Porter, Milford, all of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Jan. 28, 1974, Ser. No. 437,167
Int. Cl.² B65G *59/02*
U.S. Cl. 271—34 **6 Claims**



1. A machine for withdrawing articles from the top of an upright stack of flat articles and feeding the articles therefrom shingle-fashion which comprises means for raising the stack of articles to bring the topmost article in the stack to a pick-off station, a pick-off device at the pick-off station which includes a frame, a pick-off belt running on the frame, the belt having a lower course arranged for flatwise engagement with the topmost article, means for pivotally mounting the frame adjacent a discharge end of the pick-off device, a discriminator at the pick-off station engageable with articles below the topmost articles in the stack, means for driving the pick-off belt to advance the topmost articles over the discriminator, and conveyor means receiving the articles as they pass over the discriminator, the pick-off belt engaging articles underlying the topmost article as the topmost article is being advanced by the pick-off belt to advance the articles in shingle-fashion.

3,907,274
SHEET DELIVERY APPARATUS FOR PRINTING PRESSES INCLUDING DOUBLE STACKER

Salvatore F. D'Amato, Floral Park, and Chauncey P. Foote, Jr., Katonah, both of N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,066
Int. Cl.² B65H *29/04*
U.S. Cl. 271—64 **12 Claims**

1. Sheet delivery apparatus for receiving sheets from a printing press and carrying the sheets selectively to either of two sheet receiving positions, comprising:

a. two sheet receiving means, one at each of said positions;

b. an endless delivery conveyor extending from between the printing press, past the two sheet receiving means in succession;

c. means for driving the conveyor;

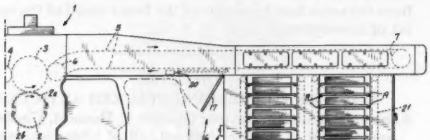
d. a plurality of gripper means spaced along the conveyor, each gripper means being shiftable between a sheet gripping position and a sheet releasing position;

e. a gripper release mechanism in each gripper means including a cam follower biased to a position in which the

gripper means engages a sheet, and movable therefrom to a retracted, sheet releasing position;

1. the cam followers for a first set of gripper means being spaced laterally of the direction of movement of the conveyor from the cam followers of a second set;

f. two cams in each sheet receiving means, respectively aligned with the two sets of cam followers, for engaging



the cam followers and thereby operating the gripper release mechanisms to their sheet releasing positions; and

g. separate actuator means for each cam, each said actuator means being operable to move its associated cam between a retracted position in which the cam does not engage any of the cam followers, and an active position in which it engages the cam followers of one set of gripper means.

3,907,275

SPEED CONTROL APPARATUS

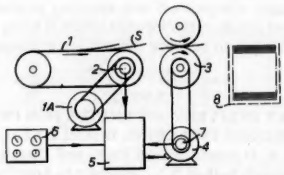
Walter Howard Bossons, Almondsbury, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Apr. 1, 1974, Ser. No. 456,451

Claims priority, application United Kingdom, Apr. 3, 1973, 15811/73

Int. Cl.² B65H *29/16, 29/22*

U.S. Cl. 271—69 **9 Claims**



1. Sheet feeding mechanism for web cutting machines including a conveyor for cut sheets, delivery means at the downstream end of the conveyor for receiving the sheets and delivering them to a layboy or the like, drive means for the conveyor and for the delivery means, and means for controlling the speed of the delivery means in accordance with the speed of the conveyor comprising means for producing a signal related to the speed of said conveyor, means for applying said signal as a control output to the drive means for the delivery means, thereby to drive the latter at a speed related to that of the conveyor, means for biasing said signal to produce a modified control output representing a speed different from that of said conveyor, and over-ride means for rendering said applying means ineffective for signals indicating speeds below a limiting speed and to apply instead a constant control output.

3,907,276

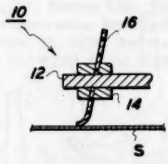
WOBBLE JOGGER

Dennis P. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 3, 1974, Ser. No. 475,676

Int. Cl.² B65H *29/20*

U.S. Cl. 271—80 **3 Claims**



1. A sheet jogging apparatus comprising:

a shaft member having its axis extending at right angles to a sheet path,

a thin disc member mounted on said shaft inclined at an angle from about 1° to about 10° to a plane perpendicular to said axis so that the plane of the disc is skewed to the rotation of said shaft whereupon sheets fed along the sheet path and contacted by said disc causes the sheets to be pushed in a direction at an angle between the sheet path and a direction perpendicular to the sheet path for one half revolution of the disc and to be pushed in an opposite direction during the next half revolution of the disc.

3,907,277

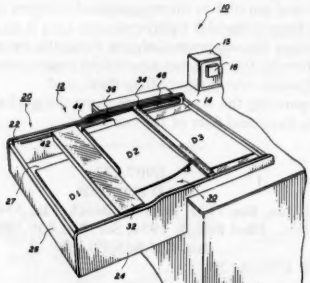
METHOD AND DEVICE FOR REMOVING DOCUMENTS FROM A PLATEN

Donald A. Robertson, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1974, Ser. No. 500,230

Int. Cl. B65h *29/46*

U.S. Cl. 271—84 **3 Claims**



1. In an electrostatic copying machine in which precollated documents are to be copied and then removed from a platen and stacked, an improved document handling device comprising:

a frame;

a cover member positioned on said frame for holding a stack of documents to be copied, said cover member being adapted for sliding movement on said frame across the platen,

said frame being formed with parallel slots contiguous to the platen, said slots extending in a linear path and then bifurcating with a first path which curves upwardly above the platen then linearly across the platen and then down-

wardly towards the platen and with a second path extending linearly and joining to the first path,

said cover member having a plurality of pin members received in said slots whereby upon sliding said cover member in a first direction it moves upwardly above the platen and then downwardly towards the platen contacting a document thereon and upon moving in a reverse direction removes the document from the platen after copying thereof and slides it into a receiving tray on the frame.

3. A method of copying documents on a copying machine wherein precollated documents are copied from a stack and then removed from the platen and restacked in collated fashion comprising the steps of positioning a stack of documents on a sliding cover adjacent to the platen, removing a first document to be copied and placing it on the platen, sliding the cover over the platen such that the bottom of the cover comes into contact with the document, copying the document, sliding the cover in a reverse direction carrying the document which has been copied with it and depositing it to a stacking area, placing the next document on the top of the platen area and repeating the before mentioned steps until all the documents have been copied.

3,907,278

SUCTION ASSISTED ENDLESS BELT SEPARATOR

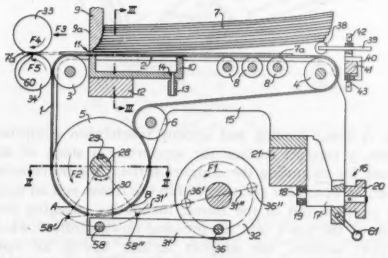
Jean-Philippe Jaton, Chapelle, Moudon, Switzerland, assignor to J. Bobst & Fils, S.A., Switzerland

Filed Feb. 11, 1974, Ser. No. 441,438

Claims priority, application Switzerland, Feb. 28, 1973, 2908/73

Int. Cl.² B65H *3/12*

U.S. Cl. 271—94 **5 Claims**



1. A device for feeding a sheet processing machine having a sheet-conveying means, said device comprising at least one endless belt conveyor positioned to feed sheets successively to said sheet-conveying means, said endless belt conveyor having an upper reach disposed generally in a horizontal plane, a drive pulley for intermittently advancing the upper reach of said belt toward said sheet conveying means, said belt being adapted to entrain, one by one, sheets taken from a pile disposed above said belt conveyor to bring the front edge of a sheet to said sheet-conveying means, means for causing a sheet to be held to said belt until withdrawn therefrom by said sheet-conveying means, a drive shaft, a unidirectional coupling means between said shaft and said drive pulley, and means for oscillating said drive shaft, said belt being only driven by said drive pulley in one direction until the front edge of a sheet has been grasped by said sheet-conveying means, said sheet-conveying means causing further advance of said belt until said sheet is drawn off of said belt, and means for braking the belt thereafter until the start of advancement of the next sheet by said drive pulley being directly coupled to said drive shaft to initiate a new cycle of sheet advancement.

3,907,279

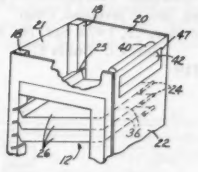
COLLATING DEVICE

James H. Ervin, Willowick, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 24, 1970, Ser. No. 66,297

Int. Cl.² B65H *39/10*

U.S. Cl. 271—173 **3 Claims**



1. A method of delivering sheets to a plurality of adjacent bins each of which as a support panel and an entrance area through which a sheet may pass into the bin, said method comprising the steps of sequentially delivering sheets to each of the bins by directing a sheet through the entrance area for each of the bins in turn, connecting the entrance area for one of the bins in communication with an adjacent bin by changing the position of a support panel for the one bin relative to the adjacent bin, delivering first and second sheets to the adjacent bin after changing the position of the support panel for the one bin by directing the first sheet through the entrance area for the one bin and directing the second sheet through the entrance area for the adjacent bin to accumulate the first and second sheets in the adjacent bin.

3,907,280

FLEXIBLE SHEET HANDLING DEVICE

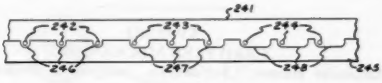
Dennis M. Bendall, Coleford; William R. Harris, Tutshill, near Chepstow; Jeffrey Kew, Upton St. Leonards; Michael C. Sherborne, Baydon, Marlborough, and John A. Jones, Coleford, all of England, assignors to Rank Xerox Ltd., London, England

Division of Ser. No. 371,453, June 19, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 464,270

Claims priority, application United Kingdom, June 23, 1972, 29645/72

Int. Cl.² B65H *29/56*

U.S. Cl. 271—174 **7 Claims**



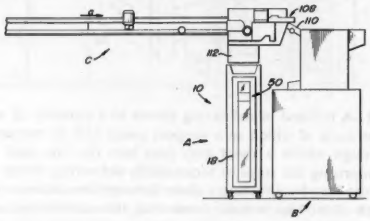
1. A puffer for removing flexible sheets from a surface, comprising a plurality of air jet orifices spaced apart from one another, and a masking member mounted for movement to any one of a plurality of predetermined positions, to selectively mask or uncover a selected number of said orifices,

wherein said masking member includes masking portions, and uncovering portions in the form of apertures, the uncovering portions being of such dimensions as to uncover selected ones of said orifices by virtue of different dimensions of said uncovering portions, and

wherein said masking member uncovering portions include in succession along said masking member a first group of one or more uncovering portions each of a width sufficient to uncover only one of said orifices, another group of one or more wider uncovering portions each of a width sufficient to uncover twice the width of one of said orifices, and a further group of one or more uncovering portions each of a greater width sufficient to uncover

three or more times the width of one of said orifices, whereby on moving the masking member from one predetermined position to another, successively more of said orifices are uncovered.

3,907,281
PAPER CATCHER DEVICE
Theodore R. McKenzie, McConnellsburg, Pa., assignor to George R. Hall, Inc., Cleveland, Ohio
Filed Mar. 15, 1974, Ser. No. 451,501
Int. Cl.² B65H *5/16*
U.S. Cl. 271—219 **18 Claims**



1. A paper catcher device adapted to receive and stack a plurality of individual papers in a generally vertically disposed face to face condition, said device comprising:

a catcher frame having spaced apart side walls and a rear wall extending between said side walls to define a paper receiving cavity having at least an open top end and a bottom end;

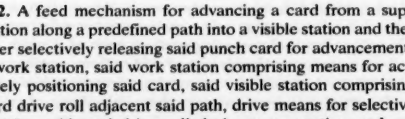
a paper supporting platen disposed within said cavity for selective movement between a first normal position adjacent said top end and a second position spaced from said first position toward said bottom end;

operative means disposed between said platen and at least one of said walls for locating said platen in said receiving cavity, said locating means guiding said platen between said first and second positions;

biasing means for continuously urging said platen toward said first position with the weight of said papers being received on said platen being sufficient to overcome the urging of said biasing means to move said platen from said first position toward said second position; and,

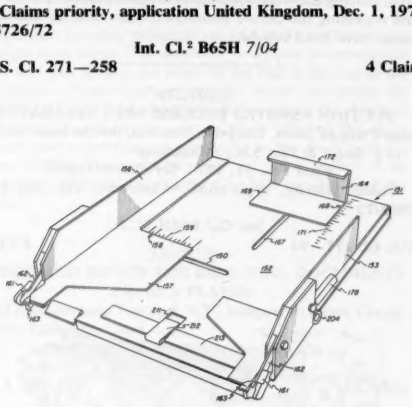
means for automatically stacking said papers on said platen in a consecutive face to face condition.

3,907,282
CARD FEED MECHANISM
Alexander Hunter, Chalfont, Pa., assignor to Decision Data Computer Corporation, Horsham, Pa.
Filed June 29, 1973, Ser. No. 374,869
Int. Cl.² B65H *9/10*
U.S. Cl. 271—233 **3 Claims**



2. A feed mechanism for advancing a card from a supply station along a predefined path into a visible station and thereafter selectively releasing said punch card for advancement to a work station, said work station comprising means for accurately positioning said card, said visible station comprising a card drive roll adjacent said path, drive means for selectively rotating said card drive roll during an operating cycle, the outer periphery of said card drive roll having a portion configured to provide unrestricted clearance for a card during an initial portion of a feed cycle during which said drive means is not rotating said card drive roll, said card drive roll having another portion configured to advance the card along the feed path during a subsequent portion of a feed cycle during which said drive means is operative to rotate said card drive roll, a pusher blade mounted adjacent said card drive roll, said pusher blade being adapted to contact the trailing edge of said card during the terminal portion of a feed cycle, and means operable in synchronism with said card drive roll for advancing said pusher blade to move said card a final increment into accurate position at said work station during said terminal portion of said feed cycle.

3,907,283
SENSING SHEETS ON A SUPPORT SURFACE
Laurence G. Miller, Drybrook, England, assignor to Rank Xerox Ltd., London, England
Filed Nov. 19, 1973, Ser. No. 417,010
Claims priority, application United Kingdom, Dec. 1, 1972, 55726/72
Int. Cl.² B65H *7/04*
U.S. Cl. 271—258 **4 Claims**



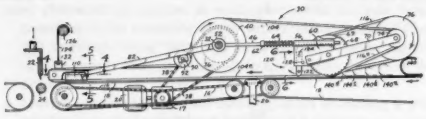
4. A sheet feeding and sensing mechanism comprising a frame, a support surface for supporting a stack of sheets, means for mounting the support surface for movement between an operative position within the frame and an inoperative position out of the frame, means for engaging the top sheet of the stack and for pressing downwardly toward the support surface, the support surface having an opening formed therein, means for sensing the bottom sheet of the stack through the opening, the sensing means being mounted for movement through the opening, means responsive to upward movement of the sensing means through the opening for indicating when the stack of sheets is depleted, the indicating means being mounted to contact the sensing means when the support surface is in its operative position and has at least one sheet thereon, and to move out of contact with the sensing means whenever the support surface is moved to its inoperative position, to thereby indicate the position of the support surface.

3,907,284
SHEET HOLD DOWN AND UNCURLER
Dennis W. Fritz, Lake Oswego, Oreg., assignor to Amos A. Horner, Cascadia, Oreg., a part interest
Filed Feb. 1, 1974, Ser. No. 438,522
Int. Cl.² B65H *5/02*
U.S. Cl. 271—273 **18 Claims**

1. A sheet hold-down device for use with conveying apparatus including support means for supporting one face of a sheet as it is moved along a path in the direction of one of its edges, said hold-down device comprising

an elongate, endless, flexible hold-down member,

a pair of training members journaled for rotation about substantially parallel axes extending transversely of said path and spaced from each other in the direction of movement for a sheet, said hold-down member being trained around said training members to provide an elongate reach extending in said direction, adjacent and substantially parallel to said support, said reach of the hold-down member being positioned to contact the face of a sheet opposite its face supported by said support means,



means mounting said training members for shifting toward and away from said support means independently of each other and yieldably biasing said training members toward said support means, and

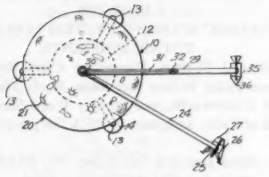
means for driving said reach of the hold-down member in said one direction including a rotatable drive member over which said hold-down member is trained, which drive member is disposed between said pair of training members and is spaced outwardly from said reach of the hold-down member in a direction away from said path.

3,907,285

SPACE AGE MODEL

Frank A. Lettieri, 38 N. Bridge Ave., Red Bank, N.J. 07701

Filed Dec. 20, 1973, Ser. No. 426,535
Int. Cl. A63h *13/20*
U.S. Cl. 272—31 A **9 Claims**



1. In a spacecraft toy, a base, a vertically disposed hollow post connected to said base, a spherical member mounted on said post, a first hollow shaft mounted in the upper portion of said post and projecting upwardly beyond the top thereof, a second shaft extending through said first shaft and through said post, a first cylindrical arm having its inner end affixed to said first shaft, flexible lines depending from the outer end of said first arm, a first spacecraft element connected to said lines; a second cylindrical arm hingedly connected to said second shaft, a flexible line depending from said second arm and having a spacecraft element connected thereto for selective engagement with the first spacecraft element, a thread connected to said second arm and extending through said second shaft, means for actuating said thread for raising and lowering said second arm, and means for rotating said shafts.

3,907,286

COIN OPERATED POOL TABLE

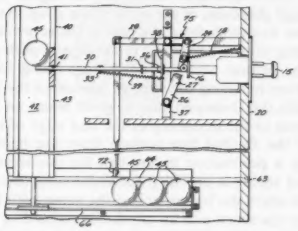
Gordon W. Murrey, 2929 W. 229th St., Torrance, Calif. 90505

Filed Sept. 14, 1973, Ser. No. 397,408
Int. Cl.[2] A63D *15/00*
U.S. Cl. 273—11 C **3 Claims**

1. In a coin operated pool table including a longitudinally inclined receiving chute adapted to receive the balls played out into the pool table pockets, and a linearly articulated coin chute, the improvement comprising:

a return tray aligned to communicate with said receiving chute;

interlock means disposed for cooperating extension with the articulation of said coin chute for extending into said receiving chute and thereby blocking the progression of the balls therealong prior to the inward ball releasing articulation of said coin chute, said interlock means including a bar mounted for translation to extend one end thereof into said receiving chute, the other end being disposed for urging by abutting contact with said coin chute; and



release means including a scissored member urged to an extended position and disposed to be collapsed by said coin chute, said scissored member operatively connecting at one end thereof to said table, a bellcrank pivotally mounted to said table proximate the center thereof and connected at one end thereof to the other end of said scissored member, a pushrod connected at one end to the other end of said bellcrank, and gate means disposed in said return tray and connected to be articulated by the other end of said pushrod for releasing the balls collected in said return tray when said scissored member is collapsed.

3,907,287

TETHERED BALL BATTING PRACTICE DEVICE

Daniel W. Fox, 202 E. Shawn, Phoenix, Ariz. 85022; Robert E. Fox, 3679 W. Dahlia Dr., Phoenix, Ariz. 85029, and Anthony E. Deprima, 3443 N. Central Ave., Phoenix, Ariz. 85012

Filed June 11, 1974, Ser. No. 478,774
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 E **2 Claims**

1. A batting practice device comprising a handle, an elongated flexible line connected to the handle and a ball connected to the end of the flexible line remote from the handle whereby the ball and flexible line may be swung in a circular path about the handle so that the ball may pass over a plate so that a batter may practice swinging a bat at the ball as it passes over the plate, said ball being in the form of a hollow, substantially rigid plastic member having a plurality of holes

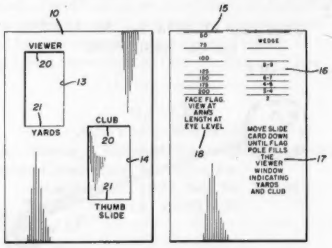
therein, said handle being in the form of a generally cylindrical handgrip having finger-receiving recesses therein, a rigid dowel fixedly disposed in the handgrip and projecting axially from one end thereof and terminating in substantially a flat end with the dowel being constructed of wood, said flexible line being constructed of plastic material and having a closed loop on the end thereof adjacent the handle, a coil spring having a loop at each end thereof with the loop on one end of the spring being engaged in the loop on the line, a metal D-shaped ring engaged with the loop on the other end of the spring, a metal strap engaged with the D-shaped ring and including overlapping end portions disposed against the flat end of the dowel, a screw extending through the overlapping ends of the strap and into the end of the dowel with the head of the screw spaced from the dowel slightly more than the combined thickness of the ends of the strap thereby enabling the strap to swivel about the axis of the screw, said D-shaped ring being pivotally received in the central portion of the strap with the central portion of the strap being formed into an offset loop receiving the straight portion of the D-shaped ring to enable the D-shaped ring to pivot about an axis generally tangential to the periphery of the end edge of the dowel, the end of the flexible line remote from the handle extending through a perforation in the ball for connection therewith, said coil spring is provided for cushioning forces exerted on the ball when the batter strikes the same with the swivel defined by the screw and the pivot axis defined by the D-shaped ring and the connection between the D-shaped ring and the spring as well as the connection between the spring and the loop on the end of the line enabling angular displacement of the line and ball thereon in any direction in relation to the handle thereby enabling the handgrip and dowel therein to be disposed substantially in a vertical direction and the flexible line and ball to move in a substantially horizontal path with the path of movement of the ball being varied by manipulative movement of the handle during manual movement thereof which causes the swinging movement of the ball and line.

3,907,288

COMBINED GOLF DISTANCE-JUDGING AND CLUB SELECTOR DEVICE

Thomas P. Hudak, 560 N. Hawkins Ave., Akron, Ohio 44313

Filed July 5, 1974, Ser. No. 485,790
Int. Cl.[2] A63B 57/00; G01C 3/00
U.S. Cl. 273—32 B **4 Claims**



1. A distance-judging device of the character described, comprising;

A. a flat generally rectangular envelope-like member having

1. at least one open edge and opposed faces,

2. at least one through window opening provided therein,

a. said window opening having at least two parallel straight line edges parallel to two side edges of said envelope-like member; and

B. a flat card

1. having the approximate dimensions of said envelope and being adapted to be slidably inserted therein, and

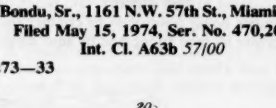
2. having at least one indicia scale thereon adapted to register with one of said straight line edges of said window of said envelope whereby distance can be judged by sliding said card to open said window to the height of an object of substantially known height as viewed by the user from a known distance.

3,907,289

GOLF TEE

David M. Bondu, Sr., 1161 N.W. 57th St., Miami, Fla. 33127

Filed May 15, 1974, Ser. No. 470,204
Int. Cl. A63b 57/00
U.S. Cl. 273—33 **2 Claims**



1. A golf tee comprising:

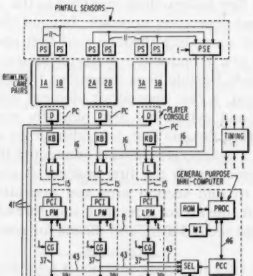
a unitary body having an upper end face, said body further having a hollow cylindrical interior portion adjacent its upper end and a solid body portion contiguous with said hollow portion, said solid body portion including a spiked end tip contiguous with a cylindrical body portion having a first diameter, a tapered body portion connected to the cylindrical portion and a second cylindrical portion having a diameter larger than said first portion, said upper end face being disposed and lying in a plane at an angle of less than 90° relative to the longitudinal axis of said body.

3,907,290

ELECTRONIC SCORING SYSTEM FOR BOWLING ESTABLISHMENTS

Joseph Bernard Fischer, Panorama City; Roy Atsushi Ito, Woodland Hills; Walter Lee Ross, Simi; Maureen Randall Schmidt, Chatsworth, and Stanley Ward Stoddard, Canoga Park, all of Calif., assignors to RCA Corporation, New York, N.Y.

Filed June 22, 1973, Ser. No. 372,647
Int. Cl.[2] A63D 5/00, 5/04
U.S. Cl. 273—54 C **2 Claims**



1. A semiautomatic scoring system for a plurality of pairs of bowling lanes comprising:

a player console for each pair of bowling lanes, including a cathode-ray-tube display device, a keyboard and a logic unit,

an electronic module for each pair of bowling lanes, including a lane-pair memory and a character generator,

said keyboard in each player console being connected to supply player and pinfall information in the form of digital signals through said logic unit in the player console to the lane-pair memory in the respective electronic module,

said character generator in each electronic module being constructed to translate digital information received from the corresponding lane-pair memory into video signals and to supply the video signals to the display device in the respective player console, and

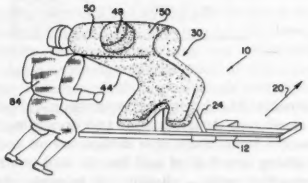
a central control unit for all bowling lanes including a proprietor's control console, a proprietor's cathode-ray-tube display device, a displayed-information printer unit, a lane-pair video signal selector to connect the video signal from the character generator associated with any desired one of said bowling lane pairs to said proprietor's display device and said printer unit, a general purpose mini-computer processor connected through a memory interface with all of said lane-pair memories so that they serve as the main memory for said processor, and a read-only memory containing a computer program for controlling the operation of the processor in the computing and display of scores in all bowling lanes.

3,907,291

EDUCATIONAL DEVICE FOR TEACHING BLOCKING IN FOOTBALL

Robert Earl Parker, 4410 W. Fourth St., Hattiesburg, Miss. 39401

Filed Feb. 27, 1974, Ser. No. 446,419
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—55 R **4 Claims**



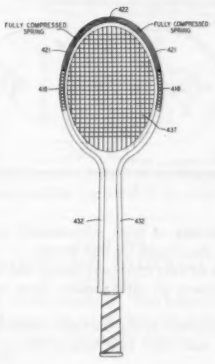
1. An improved educational teaching device for teaching blocking of opposing linemen in football games comprising upward and rearwardly extending sled frame portions terminating in a rear end portion, said sled frame being supported at its lower end by channel iron skids adapted to allow movement in a forward direction and having restraining means supported from the rear end of the sled frame terminating in a rear surface portion, half-leaf spring means mounted essentially vertically to the sled frame rear end portion and from said restraining means and having a portion of a surface of said half-leaf spring means for engaging upon said rear surface portion, a body portion mounted on said half-leaf spring means and having a simulated helmet and head area, shoulder pads area, chest area and thigh area arranged and constructed to resemble a football player, a frame element secured from said half-leaf spring means that reinforces the body portion and extends essentially horizontally between the helmet area and the thigh area thereof.

3,907,292

DYNAMICALLY VARIABLE TENNIS RACKET

James P. Moreland, 132 Appleblossom Ln., Middletown, N.J. 07748

Continuation-in-part of Ser. No. 259,459, Feb. 5, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,179
Int. Cl.[2] A63B *49/04*
U.S. Cl. 273—73 C **6 Claims**



1. A tennis racket comprising:

a. a handle portion and a head portion having longitudinal and transverse axes, a closed tubular member formed to the shape of said racket and defining first and second tubular paths, said first tubular path extending on one side of said head and handle portions from the top of said head portion, along the periphery of said head portion to said handle portion, and along at least a part of said handle portion, and said second tubular path extending similarly on the side of said head and handle portions opposite that of said first tubular path;

b. first and second substantially similar weighting means slidably disposed within said first and second tubular paths, respectively, and normally disposed at the handle portion of said tubular paths; and

c. first and second spring means located respectively in said first and second tubular paths, each of said spring means having one end fixed at the top end of its respective tubular path, each of said spring means being substantially coextensive with its respective tubular path and having its other end engaging the weight means, each of said spring means having a stiffness and length so proportioned to the mass of said weight means and to the centrifugal forces developed during the conventional arcuate full swing of any type of hitting stroke so that the spring force produced thereby is such that the weight means remain in said normal disposition when the racket is at rest in any orientation and upon impact with the ball each of said spring means will be compressed to a degree sufficient to locate said weight means substantially on the transverse axis of said head portion.

3,907,293

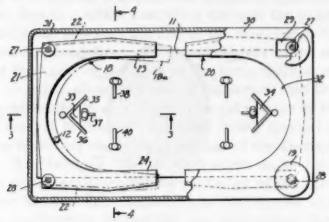
GAME APPARATUS

Wilfred M. Werner, El Monte, Calif., assignor to Fred N. Schwend, Arcadia, Calif., a part interest

Filed July 15, 1974, Ser. No. 488,450
Int. Cl.[2] A63F *7/06, 7/10*
U.S. Cl. 273—85 A **10 Claims**

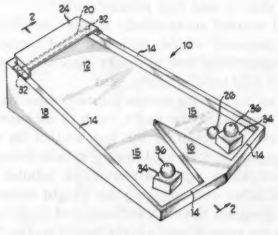
1. A game comprising

a game board for supporting a ball for rolling movement,
a pair of substantially U-shaped ball propelling members adjacent opposite ends of said board and supported for movement over said board,
said members being separated from each other,
each of said members having a pair of legs integral therewith and spaced apart a distance substantially greater than the diameter of said ball,



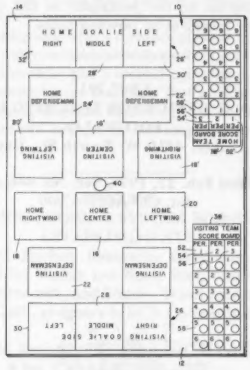
said legs extending at least substantially parallel to each other along the length of said board,
the legs of one of said members facing the legs of the other of said members to substantially form an enclosure for said ball,
each of said members being movable relative to the other to propel said ball over said board toward the other said member.

3,907,294
COMPETITIVE PROJECTILE GAME
Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass and Associates, Chicago, Ill.
Filed Aug. 13, 1973, Ser. No. 387,904
Int. Cl.[2] A63F *7/00*
U.S. Cl. 273—85 R **3 Claims**



1. A game apparatus comprising:
means defining an inclined playing surface having an upper end and a lower end, and having two playing stations at the lower end;
a reboundable spherical playing piece movably supported on said surface;
said playing surface being bounded by a pair of transversely extending opposed end retaining walls at the upper and lower ends of said surface, and a pair of generally longitudinal opposed side retaining walls extending between said upper and lower ends of said surface defining the sides of said playing surface, said side walls being angularly oriented so as to converge toward said upper end, and said side and end walls completely surrounding the playing surface and abutting the edges of the playing surface to provide for rebounding of the playing piece from any point about the playing surface;
flexible resilient rebounding barrier means mounted across the upper end of the playing surface and adapted to rebound a playing piece;
dividing means near the lower end of said surface separating the two playing stations;
a plurality of hand held, playing piece impelling instruments, whereby players of the game at their respective playing stations may strike a playing piece thereat back and forth against said resilient barrier means in an effort to direct said playing piece toward the other player's playing station, and
a shield mounted at the upper end of the playing surface spanning the retaining wall thereat and overlying said flexible rebounding barrier means to prevent the spherical playing piece from escaping the playing area adjacent the flexible rebounding barrier means.

3,907,295
HOCKEY GAME
Charles J. Eissler, 5810 N. 6th St., Philadelphia, Pa. 19120
Filed Mar. 30, 1973, Ser. No. 346,338
Int. Cl. A63f *3/00*
U.S. Cl. 273—85 R **3 Claims**



1. A simulated hockey game comprising: a playing board; a visiting team area designated on and occupying one half of said board; a home team area designated on and occupying the remaining one half of said board; said team areas each being inscribed with a plurality of separate player blocks having indicia associated therewith identifying the blocks as a center, a right wing, a left wing, two defense men and a goalie, respectively; said goalie blocks being disposed on opposing sides of said board and each being subdivided into blocks inscribed as right, middle and left, respectively;
a first goalie piece adapted to be placed in any one of the visiting team goalie blocks and a second goalie piece adapted to be placed in any one of the home team visiting blocks;
a simulated puck;
chance means for determining, at the beginning each play, which participant of the game is to assume the role of the offensive and the defensive player, respectively, and for determining the offensive player's block in which said puck is to be initially placed;
a plurality of cards for the visiting team and a plurality of cards for the home team; said cards being sized to fit in said blocks; said cards in each plurality being variously provided on their faces with indicia designating either a defense play, a pass play, or a shot play to either a right, middle or left goalie block;

whereby the offensive player draws at random a plurality of cards which may designate a shot from the block in which the simulated puck has been initially placed as aforesaid to one of the defensive player's goalie blocks or which may designate a pass play from the block in which the puck was initially placed to another offensive player's block and a shot from the latter block to one of the defensive player's goalie blocks; said so designating cards being placed face down on the appropriate offensive player's blocks; said defensive player at that time placing his goalie in the goalie block to which he thinks a shot might be directed to thereby successfully defend against said shot and at his option drawing at random a plurality of cards any one of which may designate a defense against one of the aforesaid offensive shots.

3,907,296

COILED RESILIENT BALL AND PADDLE

D. Jose Soto Burgos, Eduardo Dato-21, 10 Madrid, Spain

Continuation-in-part of Ser. No. 284,618, Aug. 29, 1972, Pat. No. 3,817,520. This application Aug. 7, 1973, Ser. No. 386,443

Claims priority, application Spain, Aug. 31, 1971, 394675The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.

Int. Cl.² A63B *71/02*

U.S. Cl. 273—95 R **4 Claims**

1. The combination of a ball and paddle for use in a sporting game in which said ball is propelled over a net by being struck with said paddle, said ball comprising two coiled strips of a lightweight shape-retaining material, each of said strips defining a plurality of substantially circular coils and each of said coils defining an imaginary plane, the planes defined by the coils of a first one of said strips being perpendicular to the planes defined by the coils of a second one of said strips, at least one of the coils of said first strip being positioned between adjacent ones of said coils in said second strip at least one of the coils of said second strip being positioned between adjacent ones of said coils in said first strip, said first and second strips being secured together at right angles to each other at a predetermined area, said paddle comprising a disc of suitable size to be held in the hand.

3,907,297

TETHERED BASKETBALL APPARATUS

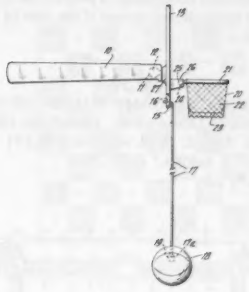
Anthony J. Di Leva, 174 W. 72nd St., New York, N.Y. 10023

Filed Apr. 25, 1974, Ser. No. 463,907

Int. Cl.² A63B *71/02*

U.S. Cl. 273—97 R **2 Claims**

1. A basketball game comprising a handle member, a backboard and a basket having an annular rim, the handle member and backboard being normally disposed and held at right angles during use and pivotally mounted relative to each other to permit the backboard to be folded down on the handle, the backboard and handle being mounted to permit the basket to fold against the backboard, the backboard being transparent and having a peripheral edge for visual contrast, and a rectangular patch on the backboard disposed with its lower edge at



a lower level than the rim of the basket, and a ball tethered to the bottom portion of the backboard by a line.

3,907,298

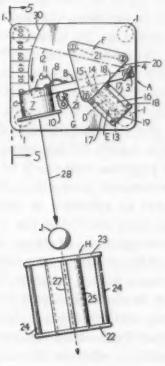
BALL SHOOTING GAME WITH BALL RECEIVING TUNNEL

Lester R. Livick, 15106 Beatty St., San Leandro, Calif. 94579

Filed Aug. 15, 1974, Ser. No. 497,661

Int. Cl.² A63B *65/12*

U.S. Cl. 273—101 **3 Claims**



1. A game comprising:

a. a ball propelling unit having a base supported on a horizontal surface, an elongated, spring biased, retractable arm pivotally attached at one of its ends to said base and being swingable in a plane parallel to said surface, said pivotal arm carrying a ball receiving receptacle at its free end;

b. a stop member; said stop member being attached to said base at a point spaced from and in the path of said pivotal arm such that it will engage said pivotal arm intermediate its ends to cause a sudden stop of said pivotal arm after said pivotal arm has been retracted against said spring and released;

c. a tunnel unit spaced from said ball propelling unit and being supported by said surface, said tunnel unit having side, top and bottom walls, the bottom wall of said tunnel lying in a plane with said propelling unit base;

d. said receptacle having an opening whose plane extends at a right angle to the plane of said surface; and

e. whereby a retracting of said swingable arm with a ball in said receptacle and a sudden freeing of said arm will cause the arm and receptable to propell the ball over said surface and through said tunnel if the aim of the moving ball is correct.

3,907,299

ELECTION PROCESS GAME BOARD APPARATUS

Edward J. Kristen, 162 Cushwa Dr., Centerville, Ohio 45459

Filed Aug. 2, 1974, Ser. No. 494,211

Int. Cl.[2] A63F *3/04*

U.S. Cl. 273—134 AD **7 Claims**

5. Game board apparatus, comprising: a game board having a playing path, the playing path having a plurality of areas designating various types of vote-getting practices, the game board having areas designating various States, certificates for indicating participation in the various vote-getting practices, chance means for determining the number of areas along the path through which the respective player has advanced in accordance with the chance means, a set of popular vote cards for each player, the popular vote cards being of a size to be superimposed on the individual State designating areas, the sets of popular vote cards having means for visually distinguishing the set of popular vote cards of each player from the set of popular vote cards of each other player, the playing path enabling the players to advance in turn to the vote-getting practice areas and thus receiving the certificates, and upon landing on the vote-getting practice area again, receiving votes in the form of the popular vote cards which can be used in winning one or more States, wherein the popular vote cards for each player are in more than one denomination, one side of each popular vote card having a designation as to how many votes are represented by the card and the other side being free of any such designation, wherein the markers have means for visually distinguishing the marker of one player from the marker of any other player, and wherein the marker-visual-distinguishing means for each player corresponds to the popular-vote-card-distinguishing means for that player.

3,907,300

POST OFFICE BOARD GAME

Clarence T. Dalton, Box 474, Watkinsville, Ga. 30677

Filed Feb. 22, 1974, Ser. No. 444,797

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—134 AD **2 Claims**

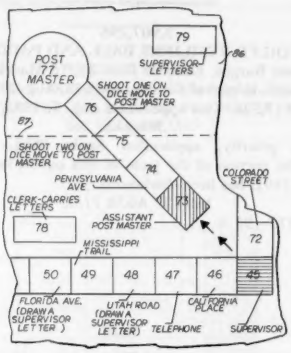
1. A post office board game apparatus adapted to be played by a plurality of players operating in turn, the apparatus comprising in combination:

a flat rectangularly shaped playing board having a playing surface defined on a base surface thereof;

a first series of playing squares disposed about the perimeter of the playing surface in side-by-side relationship to define a border of contiguous playing squares thereabout, there being 12 playing squares disposed along each edge of said playing surface;

a second series of playing squares identical in size and configuration to said first series of playing squares and disposed inwardly of said first series of playing squares to define a square pattern disposed concentric with said first series of playing squares and spaced inwardly therefrom, there being eight playing squares disposed along each side of the second series square pattern;

a series of four playing squares identical in size to the first and second series of playing squares extending diagonally through the center of said inner square pattern and having an entrance end and an exit end;



a finishing circle having one edge formed contiguous with the exit end of the diagonally disposed squares in alignment therewith and defining the finishing position for playing of the game;

a plurality of distinguishable playing pieces each intended to be utilized by one of the players during the play of the game;

a single playing die defining a chance device to determine the number of playing squares a player is to move his individual playing piece on any turn of the player;

a first and second stack of a plurality of identically sized and configured playing cards, each stack intended to be positioned in an area inwardly of the inner square pattern on opposite sides of the diagonally disposed playing squares in appropriate areas marked therefor on the face surface of the playing board;

said first stack of cards consisting of a plurality of Supervisor Letters each of a flat rectangular configuration having a back surface and a face surface, each of said surfaces being identical and having identifying indicia reading "Supervisor Letters" imprinted thereon and each of said face surfaces having an instruction imprinted thereon for the player taking said card to follow, such instructions being for the player to move his individual playing piece forwardly or rearwardly along the playing squares to a specific square thereon as indicated by the card picked by the player;

said second stack of cards each being of a flat rectangular configuration having identical back surfaces and a face surface, each of said back surfaces having identifying indicia reading "Clerk-Carries Letters" imprinted thereon, and each face surface having an instruction imprinted thereon to be followed by the player upon the picking of such card, such instruction being for the player to move his playing piece forwardly or rearwardly along the playing squares to a particular square as designated on the picked card before the play of the game continues;

indicia imprinted on certain of the playing squares requir-

ing that a player's playing piece occupying one of such squares must pick one of the cards from the stack of Supervisor Letters;

indicia carried by certain of the playing squares requiring that a player's playing piece occupying such square must pick one of the cards from the stack of Clerk-Carries Letters cards;

a distinctively colored playing square forming one of the squares of the second series of playing squares positioned in a corner thereof and identified as the Supervisor square;

a second distinctively colored square disposed at the entrance end of the diagonally disposed playing squares and forming one of such squares and identified as the Assistant Post Master square;

indicia carried by certain of the squares preceding the identified Supervisor square requiring that a player's playing piece occupying such square immediately move forward to the Supervisor square as a bonus to such player;

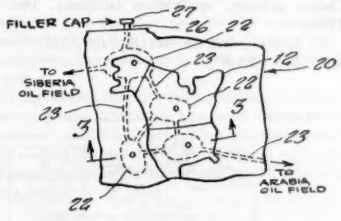
indicia carried by certain of the playing squares disposed between the Supervisor square and the Assistant Post Master square requiring that a player's playing piece occupying such square immediately move forward to the Assistant Post Master square as a bonus to such player; and

the circular playing position disposed at the exit end of the diagonally disposed series of playing squares being marked as "Post Master" with the first player reaching this position becoming the winner of the game.

3,907,301
ENERGY CRISIS GAME

Albert W. Adcock, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed May 13, 1974, Ser. No. 469,231
Int. Cl.² A63F *3/04*
U.S. Cl. 273—135 AB **3 Claims**



1. A game board for playing a game related to oil fields, said board including spaced depressions for containing liquid with open channels interconnecting said depressions, in combination with a flexible sheet mounted over the board sealingly engaging the board areas encompassing the depressions, said sheet being sufficiently deformable to be depressed manually to seal selected channels, in combination with spaced outlet means through said sheet communicating with each depression for spouting liquid responsive to manual pressure on the sheet at each depression to simulate oil pumping, including a filler inlet means to said chambers.

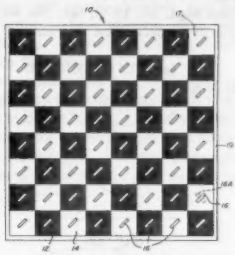
3,907,302
CHESS SET

John E. Butler, 299 Roehampton Ave., Toronto, Ontario, Canada (M4P 1S2)

Filed Mar. 5, 1975, Ser. No. 555,528
Int. Cl.² A63F *3/02*
U.S. Cl. 273—136 E **5 Claims**

1. For use with a plurality of substantially flat playing pieces each having a projecting tab, a playing board comprising:

a substantially two-dimensional plate member marked on one surface with a grid pattern of rectangles in contrasting colours,

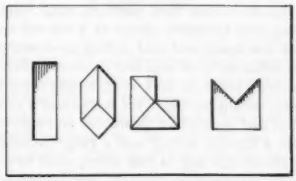


the plate member having a plurality of elongated pockets extending perpendicularly away from said one surface, each pocket opening through one of said rectangles substantially diagonally thereof, whereby a playing piece may be placed on the board with its projecting tab received in one of said pockets.

3,907,303
GEOMETRICAL PUZZLE PIECES AND INLAY BOARD

John L. Locker, 338 Flurnoy St., Florence, Ala. 35630

Filed July 16, 1974, Ser. No. 489,040
Int. Cl.² A63F *9/10*
U.S. Cl. 273—157 R **3 Claims**



1. A geometrical puzzle comprising an inlay board having a plurality of predetermined geometrical patterns thereon and seven multilateral sections at least some of which can be arranged to form said predetermined geometrical patterns, none of the shapes of the sections occurring more than twice and no more than two of the pieces being identical, said seven sections including:

two identical isosceles right triangles each having the two equal sides of the length of the squareroot of 2 times S; two identical but smaller isosceles right triangles each having the two equal sides of the length S;

one square having each side of the length S; and

two identical rhomboids each having two opposing sides thereof the length of the squareroot of 2 times S and the other two opposing sides thereof the length S; wherein S is a predetermined unit of length, the above sections, when combined and arranged into a predetermined geometrical pattern, have selected edges thereof abutting, the overall arrangement defining said geometrical pattern, said patterns being sized and shaped to accommodate said two smaller triangles and any combination of a given number, greater than 1 and not greater than 3, of the other sections, and having an area substantially equal to the sum of the areas of said two smaller triangles and said given number of other sections.

3,907,304

SWITCHING DEVICE, IN PARTICULAR FOR A RECORD PLAYER OR CHANGER

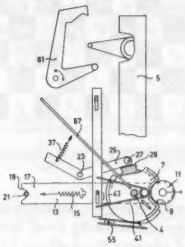
Kurt Eisemann, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,872

Claims priority, application Germany, Oct. 13, 1972, 2250127

Int. Cl.[2] G11B *17/00*

U.S. Cl. 274—9 A **3 Claims**



1. A switching device for a phonograph record changer of the type having means for controlling the speed of a turntable and means for selecting a tone-arm setting-up diameter, comprising a single switching member connected to a single control device for positioning said device in a selected one of a plurality of positions, and means responsive solely to the position of said device for controlling the speed of the turntable and the tonearm setting-up diameter, wherein said control device is movable at least to first and second positions, said responsive means controlling said turntable speed at a first speed and said setting-up diameter at a first diameter when said device is in said first position, said responsive means controlling said turntable speed at a second speed different from said first speed and said setting-up diameter at a second diameter different from said first diameter when said device is in said second position; and wherein said means for selecting a tone-arm setting-up diameter comprises a tab movable between first and second tab positions, and said control device comprises a hairpin spring, and a ridge projecting from said device between the legs of said spring so as to keep the spring in an expanded condition, said tab being disposed between the ends of the hairpin spring for engagement thereby, said tab being held in said first tab position when said control device is in said first position, said tab being held in said second tab position when said control device is in said second position.

3,907,305

AUTOMATIC RECORD CHANGING

Bruno Paul; Jürgen Wilisch; Günter Wimmer, and Volker Richter, all of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, both of Zug, Switzerland

Filed Aug. 14, 1974, Ser. No. 497,385

Claims priority, application Germany, Aug. 29, 1973, 2344106

Int. Cl.[2] G11B *17/10, 5/82, 17/04*

U.S. Cl. 274—10 R **20 Claims**

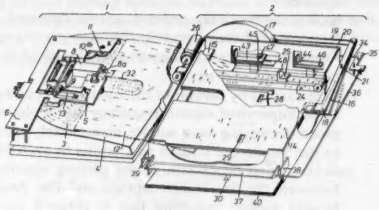
10. In a record player including a playback portion, a record disc storage portion, and apparatus for transporting successive record discs from the storage portion to the playback portion, the storage portion being arranged to hold a stack of such discs with each disc being in an associated protective cover which is open along one edge for passage of the disc into and out of the cover and each successive disc being introduced into the storage portion, in its associated cover, by being placed on the top of the stack, the improvement wherein said apparatus comprises, in combination:

separating means located in the vicinity of the bottom of such stack in the storage portion for separating the lowermost cover containing a record disc from the stack and lowering the separated cover to an enabling position;

engaging means disposed for drivingly engaging a protective cover in such enabling position;

drive means operatively connected to said engaging means for moving said engaging means, and a cover engaged thereby, toward the playback portion for removal of the disc from the cover to enable the record disc to be played and reinsertion of the disc into its cover after having been played, and away from the playback portion to a waiting position;

releasing means for releasing a cover, when in the waiting position, from said engaging means and for guiding the cover to a removal position in a region provided in said storage portion for accommodating a plurality of covers, one atop the other, subsequent to such release.



3,907,306

TONE ARM SUSPENSION FOR A RECORD CHANGER

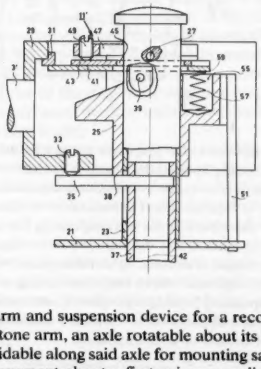
Jurgen Muller, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,253

Claims priority, application Germany, Dec. 21, 1972, 2262661

Int. Cl.[2] G11B *3/10, 3/00*

U.S. Cl. 274—23 R **9 Claims**



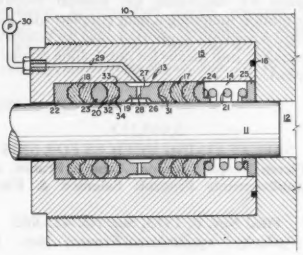
1. A tone arm and suspension device for a record changer, comprising a tone arm, an axle rotatable about its longitudinal axis, means slidable along said axle for mounting said tone arm for pivotal movement about a first axis perpendicular to said axle axis, a tone arm lifting means for lifting said mounting means and tone arm upward during a change cycle and for subsequently lowering said mounting means and tone arm, and means for sensing contact of said tone arm with a record and engaging said mounting means to said axle upon such contact, such that the height position of the mounting means adapts to a varying height of a stack of records, wherein said means for sensing and engaging comprise a tilting member which engages said axle by tilting with respect to said axle to

jam against it so as to prevent movement of said mounting means downward, the jamming engagement being released by rotating said tilting member toward an angular position perpendicular to said axle axis during upward movement of said tone arm lifting means, and means for retaining said tilting member in position with respect to said axle for jamming engagement and release.

3,907,307
PACKING ASSEMBLY

William C. Maurer; Joe K. Heilhecker, and Everett H. Lock, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Nov. 1, 1972, Ser. No. 302,966
Int. Cl. F16j *15/18, 15/40*
U.S. Cl. 277—69 **9 Claims**



1. A packing assembly in a plunger pump for sealing the annular space between plunger and pump body which comprises:

a first packing mounted in a forward interval of said annular space;

a second packing mounted in a rear interval of said annular space;

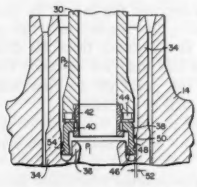
a lubricating ring mounted in said annular space between said packings, said first and second packing and said lubricating ring being subject to hydraulic pumping pressure; and

means for preventing the forward extrusion of said second packing past said lubricating ring, said means including lip members extending rearwardly from said lubricating ring for sealing the clearance gaps between said lubricating ring and the pump body and between the lubricating ring and plunger.

3,907,308
BELL SEAL VIBRATION DAMPER AND SEAL IMPROVEMENT

Alvin L. Stock, Wallingford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 27, 1973, Ser. No. 401,522
Int. Cl. F16j *15/40*
U.S. Cl. 277—72 R **5 Claims**



1. An axial flow elastic fluid turbine apparatus comprising:

an inner cylinder;

a nozzle chamber integral with said inner cylinder, said nozzle chamber having a surface thereon;

conduit means for introducing said elastic fluid into said nozzle chamber

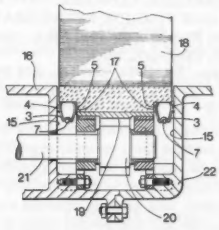
a bell seal device disposed between said conduit means and said surface of said nozzle chamber, said bell seal device having an outer surface thereon, said bell seal device having a groove disposed circumferentially about the outer surface thereof; and,

an expandable annular seal ring having an axis extending therethrough disposed within said groove on said bell seal device, said seal ring having a radially inner and a radially outer surface with respect to its axis thereon, said seal ring disposed within said groove so that said radially outer surface thereof abuts against said surface of said nozzle chamber.

3,907,309
RESILIENT SEAL

Edward Griffiths, Birmingham, England, assignor to Caterpillar Tractor Company, Great Britain

Filed Aug. 12, 1974, Ser. No. 496,729
Int. Cl.² F16J *15/34*
U.S. Cl. 277—84 **4 Claims**



1. A resilient seal, for engagement between two surfaces, comprising an elongate sealing portion formed from resilient sheet material and having a transverse cross-section of channel shape, the base of the channel having a depression in the surface thereof external to the channel and extending throughout the length of the seal, the seal also comprising a constraining element located in the depression in the base of the channel and extending lengthwise thereof and acting to urge the base of the channel inwardly, thereby to cause the sides of the channel to be pressed laterally-outwardly of the channel into sealing engagement with the respective surfaces.

3,907,310
FLOATING SEAL CONSTRUCTION

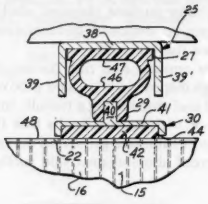
Raymond James Dufour, Wheaton, Ill., assignor to Gas Developments Corporation, Chicago, Ill.

Continuation of Ser. No. 118,641, Feb. 25, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,432
Int. Cl. F16j *15/38*
U.S. Cl. 277—92 **5 Claims**

1. An improved seal assembly for use with an imprecisely fabricated apparatus to continuously seal a gap between spaced fixed and rotating members comprising, in combination:

a. an integral self-energizing resilient member including a generally planar base portion for sealingly securing said seal assembly to one of said members, an intermediate hollow, tubular portion connected to said base portion and elastically flexible in response to any irregularity arising from the movement of said members relative to each other, and a seal gripping portion including a pair of gripping lips, said gripping portion connected to said hollow tubular portion; and

b. a sealing member removably secured to said resilient member by said gripping lips, said sealing member comprised of a relatively low friction material adapted for contact with the other of said members, said hollow tubular portion of said resilient member biasing said sealing



member against said other member, whereby said seal assembly compensates for axial and planar misalignment and out-of-roundness of said members relative to one another and said sealing member continuously engages said other member.

3,907,311

HIGH TEMPERATURE, LOW FRICTION CERAMIC COATING FOR GAS TURBINE REGENERATOR SEALS

V. Durga Nageswar Rao, Woodhaven, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 15, 1974, Ser. No. 461,197

Int. Cl.[2] F16J *15/16*

U.S. Cl. 277—96 R **2 Claims**

1. A high temperature, low friction ceramic coating for use with a sliding seal surface for a ceramic regenerator core seal in a gas turbine engine whereby the coating material is slidably situated in sealing engagement with the sealing surface of the rotary ceramic matrix, said coating material comprising zinc oxide, calcium fluoride and manganese oxide in the form of a sintered powder deposit which is applied to the aforesaid seal surface, the percentage of manganese oxide being between 5% and 30% by weight.

3,907,312

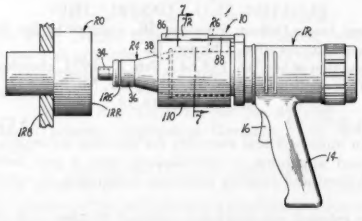
SYSTEM FOR ENHANCING TOOL-EXCHANGE CAPABILITIES OF A PORTABLE WRENCH

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of Ray E. Marlow, Huntsville, Ala.

Filed Aug. 9, 1973, Ser. No. 387,095

Int. Cl. B23b *31/02*

U.S. Cl. 279—89 **7 Claims**



1. In an improved system for enhancing tool-exchange capabilities of a wrench, the improvement comprising:

a sleeve mounted in circumscribing relation with a wrench motor adapted to impart motion to a tool mated therewith;

pressure-responsive means for coupling a tool to said sleeve comprising a plurality of fingers pivotally coupled to said sleeve, each of said fingers being characterized by means defining at one end thereof a stop extended radially with respect to the sleeve, means defining at the opposite end of the finger a lever arm, and means defining a fulcrum interposed between the ends of the finger, whereby each of the fingers is supported for pivotal oscillation about a fulcrum for displacing a stop in radial directions;

an actuator including an annular member concentrically related with said sleeve and supported for rectilinear reciprocation therealong having an internal camming surface for simultaneously engaging the adjacent surfaces of the said fingers near each of the opposite ends thereof for imparting pivotal motion thereto;

means for imparting rectilinear motion to said annular member;

means for restraining the annular member against linear motion for thereby restraining the fingers against oscillatory motion;

said means for restraining the annular member against linear motion including a cam coupled with said annular member, a pivotally supported pawl for selectively engaging said cam, and means for controlling pivotal motion of said pawl.

3,907,313

SAFETY FIXING DEVICES FOR SKIS

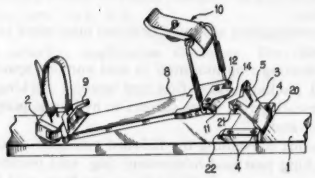
Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Filed Nov. 8, 1973, Ser. No. 413,985

Claims priority, application France, Nov. 13, 1972, 72.40183

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—11.35 K **4 Claims**



1. In a safety binding device for skis, a system for automatically positioning the boot of a skier with respect to the axis of the ski when the skier puts on his ski; the sole of the boot of the skier bearing a first ramp symmetrically shaped with respect to the longitudinal axis of the boot; said system being composed of a bridge-member mounted on the ski, said bridge member including:

a movable portion;

a second ramp fixed on said movable portion, said ramp being symmetrically shaped with respect to the longitudinal axis of the ski and adapted to cooperate with said first ramp for locking the boot with respect to the movable portion: the angle between the tangent to the profile of the second ramp and the axis of the first ramp of said ski boot exceeding 90 degrees and the profile of the first ramp being at a distance from the center of pivoting of the ski boot less than the distance from said center of pivoting to the point of the first ramp located in the longitudinal axis of symmetry;

said portion being movable between two positions:

a first position for which said portion is raised with respect to the ski,

a second low position for which said portion is folded onto the ski and locked with respect thereto and for which said first and second ramps cooperate to lock the boot with respect to said movable portion;

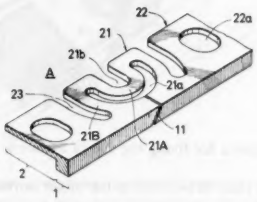
said movable portion being actuated from said first position to said second position by the skier with the sole of his boot when he puts on the ski.

3,907,314

EDGE MEMBERS FOR SKI

Ryoji Tanahashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 15, 1974, Ser. No. 443,115
Claims priority, application Japan, Feb. 20, 1973, 48-20374
Int. Cl.[2] A63C 5/04
U.S. Cl. 280—11.13 E 4 Claims



1. An edge member for a ski, comprising a straight portion and a web extending horizontally from one side of said straight portion,

said straight portion being divided into a plural number of sections by slit-like cracks,

said web having, in each region corresponding to a crack, a pair of grooves each having one closed end located close to the straight portion and an open other end, said pair of grooves being positioned so that the crack is intermediate the closed ends of said pair of grooves,

said web further having, in each said region, a connecting member for connecting adjacent ones of said sections of the straight portion, said connecting member being flanked, via said pair of grooves and, by reinforcing members, said reinforcing members forming the portion of the web between successive pairs of grooves,

said connecting member further having, at a site substantially corresponding to the extension of said crack, an inner cutout with one closed end and open other end and an elongated slot surrounding this inner cutout, said crack being open into the elongated slot,

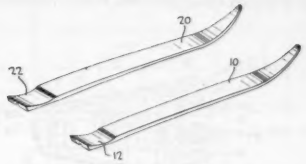
said connecting member further having a pair of resilient projections defined by said pair of grooves and said elongated slot; a resilient flap defined by said elongated slot and said inner cutout; and connecting portions for connecting said resilient projections with said flap.

3,907,315

SKIES

Joseph P. Charneck, 3730 St. Margaret St., Baltimore, Md. 21225

Filed Apr. 30, 1973, Ser. No. 355,670
Int. Cl. A63c 5/00
U.S. Cl. 280—11.13 S 8 Claims



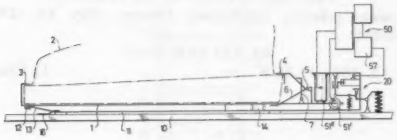
1. A pair of skies, said pair having a right and left ski, and one of said right and left ski having a predetermined and noticeably narrower width than the other of said pair, to provide greater control and maneuverability for a skier who favors one leg over the other.

3,907,316

METHOD AND DEVICES FOR RELEASING A SKI BOOT FROM THE SKI

Hannes Marker, Garmisch-Partenkirchen; Heinz Korger, Munich, and Hans-Joachim Steinmetz, Karlsruhe, all of Germany, assignors to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed Sept. 13, 1973, Ser. No. 396,723
Claims priority, application Germany, Sept. 13, 1972, 2244949
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 M 26 Claims



1. A method of automatically releasing a ski boot from a ski on which the ski boot is mounted, in the event of danger to the skier, the method comprising the steps of: constantly monitoring the forces acting on a skier's leg; generating force signals representative of the forces acting on the skier's leg; developing a threshold signal representative of the maximum stresses to be tolerated by the skier's leg; developing a control signal whose continuous magnitude is dependent both upon the magnitude and duration of the force signals; comparing said control signal with said threshold signal and releasing the ski boot from the ski upon the control signal reaching a value at least equal to that of said threshold signal.

3,907,317

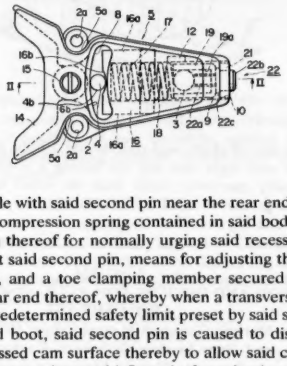
TOE PIECES OF SAFETY SKI BINDINGS

Masahiro Murata, and Michio Iizuka, both of Tokyo, Japan, assignors to Hope Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1974, Ser. No. 443,988
Claims priority, application Japan, Feb. 25, 1973, 48-22402; June 30, 1973, 48-73911
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 T 8 Claims

1. In a toe piece of a safety ski binding of the type including a rotatable toe clamping member which acts to normally clamp the toe of the soleplate of a ski boot but is rotated to

release the toe when a transverse force exceeding a predetermined limit is applied to the boot, the improvement which comprises a base plate to be secured to the ski, first and second pins which are secured to said base plate near the fore end and the rear end thereof respectively, a body pivotally mounted on said first pin located near the fore end, said body being provided with a cam receiving chamber near the rear end thereof, a cam received in said cam receiving chamber to be slidable in the direction of the axis of the ski, the rear end surface of said cam being provided with a recessed cam surface engageable with said second pin near the rear end of said base plate, a compression spring contained in said body in the axial direction thereof for normally urging said recessed cam surface against said second pin, means for adjusting the force of said spring, and a toe clamping member secured to said body at the rear end thereof, whereby when a transverse force exceeding a predetermined safety limit preset by said spring is applied to said boot, said second pin is caused to disengage from said recessed cam surface thereby to allow said cam and said body to rotate about said first pin for releasing the toe from said toe clamping member.



3,907,318

SAFETY BINDING FOR SKI BOOTS

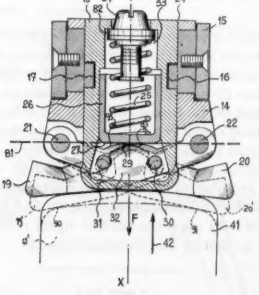
Georges Pierre Joseph Salomon, 34, Avenue de Loverchy, Annecy (Haute-Savoie), France

Filed May 8, 1973, Ser. No. 358,329

Claims priority, application France, May 10, 1972, 72.16741

Int. Cl.[2] A63C 9/00

U.S. Cl. 280—11.35 K **12 Claims**



1. A safety ski binding including two locking systems binding the opposite ends of a boot to a ski, at least one of said locking systems resiliently holding said boot to said ski in both lateral and longitudinal directions, comprising: a body; a pair of lever means, each having a portion thereof cooperating with one of said opposite ends of said boot, each said lever means hingedly mounted in relation to said body and being tiltable forwardly and rearwardly with respect to the ski according to longitudinal positions of said boot on said ski; spring means for applying each said portion of said lever means against said boot having one end resting against said body and the opposite end acting on said lever means; the contact areas of said lever means with said opposite end of said spring means defining, for various longitudinal positions of said boot on said ski, tangent planes perpendicular to the direction of the force exerted by said spring means; said contact areas being consistently adjacent to a plane extending through the hinge axes of said lever means; said plane extending through the hinge axes of said lever means being perpendicular to the direction of said force exerted by said spring means.

3,907,319

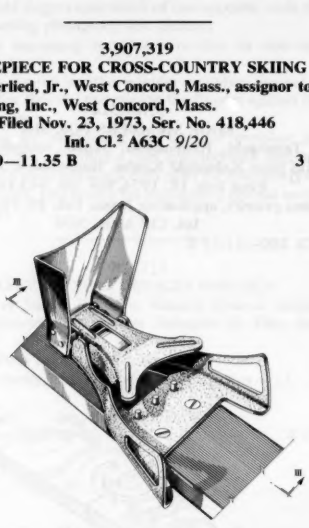
TOEPIECE FOR CROSS-COUNTRY SKIING

Henry P. Berlied, Jr., West Concord, Mass., assignor to Dovre Ski Binding, Inc., West Concord, Mass.

Filed Nov. 23, 1973, Ser. No. 418,446

Int. Cl.[2] A63C 9/20

U.S. Cl. 280—11.35 B **3 Claims**



1. A toepiece for fixing the toe of a boot to a ski, comprising:

a. a base plate to be fixed to the upper horizontal surface of the ski,

b. a vertical pin extending upwardly from the base plate to engage an aperture in a bottom surface of the toe of the boot,

c. a lip movable between a first upper position and a second lower position where it engages an upper surface of the toe of the boot, the lip holding the toe of the boot on the base plate while in the second position, and not interfering with the boot in the first position,

d. a lip carrier having a first end that carries the lip, and a second end, the lip carrier being pivotally mounted between its first and second ends to the base plate on a horizontal axis lateral to the ski,

e. binding means for causing the lip to engage and disengage the boot by controlling the distance between the second end of the lip carrier and the base plate, and thereby moving the lip between its first position and its second position, the binding means including a closing lever pivotally mounted to the second end of the lip carrier, the closing lever having a first arm which is positioned between the second end of the lip carrier and the base plate, and a second arm, the movement of the second arm being limited from an open, generally vertical position which causes the lip to be in its first position free of the boot and causes upward force on the lip to be ineffective in moving the lip from its second lower position to its first upper position, to a closed generally horizontal position directed rearwardly from the pivot with the carrier, which causes the lip to be in its second position in contact with the boot and, during that movement, the first arm moving from a first position on one side of the vertical plane including the axis between the closing lever and the lip carrier, to a second position on the other side of the

plane, thereby forming an over-center mechanism which forces the lip against the toe of the boot, the closing lever being in the form of a cover which encloses a portion of the base plate and lip carrier when the second arm is in its closed position, the closing lever including a top plate, a front plate and two side plates arranged so that when the second arm is in its closed position the top lies horizontal and above the axis between the lip carrier and the base plate, the front plate extends downwardly from the forward edge of the top plate and the side plates extend downwardly from the side edges of the top plate laterally outward of the laterally outward edges of the base plate, and

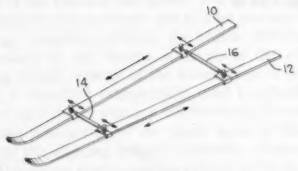
f. a spring means to bias the lip toward its first upper position and thereby bias the first arm of the closing lever into contact with the base plate, the spring means including a U-shaped spring which passes around the axis between the lip carrier and the base plate and which contacts the lip carrier and the base plate.

3,907,320

SKI TRAINER

Joseph P. Charneck, 3730 St. Margaret St., Baltimore, Md. 21225

Filed Apr. 30, 1973, Ser. No. 355,669
Int. Cl.[2] A63C *11/00*
U.S. Cl. 280—11.37 E **9 Claims**



1. A ski trainer comprising in combination (a) a right and left ski, each having a nose and tail section; (b) spacer means removably secured to the nose section of each of said right and left ski; and (c) spacer means removably secured to the tail section of each of said right and left ski; said spacer means secured to the nose section being shorter than the spacer means secured to the tail section whereby the nose section of said skies extends inward, said spacer means permitting lateral movement and constructed and arranged with adjustable bracket means including a top section and two side sections, at least one of said side sections being movably attached to said top section and having means for rendering said side sections immovable with said top section.

3,907,321

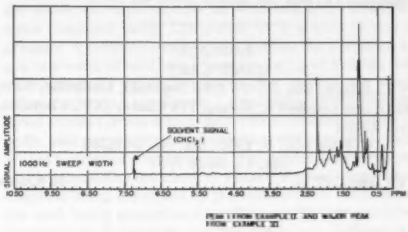
NOVEL TOBACCO PRODUCT COMPRISING ONE OR MORE ISOMERS OF AN OCTAHYDROTETRAMETHYL ACETONAPHTHONE

John B. Hall, Rumson, and James Milton Sanders, Eatontown, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 434,948, Jan. 21, 1974, which is a continuation-in-part of Ser. No. 336,172, Feb. 27, 1973, abandoned. This application Dec. 3, 1974, Ser. No. 529,087
Int. Cl.[2] A24B *15/04*
U.S. Cl. 131—17 R **3 Claims**

1. A tobacco product comprising tobacco, said product having added thereto an amount of from 100–2,000 ppm and sufficient to alter the flavor or aroma of the tobacco product of an organoleptic-property-altering composition containing a major proportion of 1′,2′,3′,4′,5′,6′,7′,8′-octahydro-2′,3′,8′,8′-tetramethyl-acetonaphthone isomers produced by a process comprising the steps of:

i. Admixing at a temperature of from about 0°C up to about 50°C myrcene and 3-methyl-3-pentene-2-one in the presence of a Lewis acid catalyst thereby forming a acetyl substituted cyclohexene mixture, and



PEAK 1 FROM EXAMPLE II AND MAJOR PEAK FROM EXAMPLE III

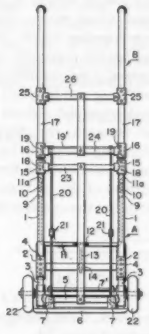
ii. Cyclizing the resulting acetyl substituted cyclohexene mixture with a cyclizing agent selected from the group consisting of concentrated phosphoric acid, sulfuric acid, boron trifluoride and complexes of boron triflouride, and iii. Obtaining a distillation fraction having a boiling point of 129°–131°C at a pressure of about 2.6–2.9 mm of mercury.

3,907,322

COLLAPSIBLE HAND TRUCK

Keizo Kiryu, 2-1 Hacchobori 4-chome, Chuo-ku, Tokyo, Japan

Filed July 8, 1974, Ser. No. 486,309
Int. Cl.[2] B62B *1/04*
U.S. Cl. 280—36 C **3 Claims**



1. In a collapsible hand truck having:

a. a body (A) defined by a pair of parallel support members (1) with upper and lower ends and wheels attached to said lower end on either side of said body;

b. a pair of tubular handle members (17) pivotally connected to said support members upper end;

c. a scooping plate (6) pivotally connected to the lower end of said support members; and

d. connecting means connecting said handle members and scooping plate including a pressing member (11) connected to said connecting means to cause said scooping plate (6) to pivot upwards, said handle members (17) to pivot downwards, to collapse said hand truck into a small compact unit, the improvement in said hand truck wherein the support members (1) are tubular support members including therein springs (8) and connecting rods (9), forming part of said connecting means, said connecting rods (9) being capable of freely entering or

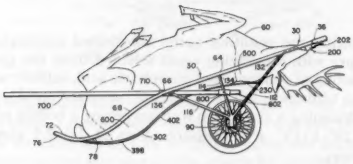
emerging from the upper ends of the supports (1) and serving to receive the action of the springs (8) and to connect the supports (1) to the handle members (17) so that the body (A) is firmly connected to the handles by the insertion of the connecting rods (9) into both the supports (1) and the handle members (17).

3,907,323

GAME CART

Larry L. Knapp, Box 26, c/o John Bojanski, Louisville, Nebr. 68037, and Leonard A. Knapp, 116 Cherry O.V., Cheyenne, Wyo. 82001

Filed Apr. 9, 1973, Ser. No. 349,265
Int. Cl. B62b *1/14*
U.S. Cl. 280—47.3 **10 Claims**



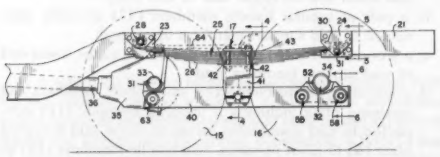
1. A game cart having a frame, ground-engaging wheel means rotatably attached to and supporting said frame, said wheel means defining all ground-engaging wheel means on said cart and rotating about a single axis line, said wheel means being disposed substantially at the center from right to left of said cart, said frame having rear grip portions at its rearward end adapted to be gripped by the hands of an operator, said frame having a first carcass recess means in its upper side disposed above its wheel means, said frame having a second carcass receiving recess means in its upper side and disposed forwardly of said wheel means, said frame having a first carcass recess bottom-forming means disposed above said wheel means, said frame having a second carcass recess bottom-forming means disposed a substantial distance forwardly of all wheel means on said cart and adapted to receive therein the buttocks of an animal when the animal is carried with its legs upward and its tail forward, the depth of said second carcass recess bottom-forming means being greater than the depth of said first carcass recess bottom-forming means so as to carry the buttocks portion of the carcass as low as possible for a low center of gravity for the combined cart and carcass to provide stability.

3,907,324

VEHICLE SUSPENSION SYSTEM

John B. Mastin, Walnut Creek, Calif., assignor to Hendrickson Manufacturing Company, Lyons, Ill.

Filed Nov. 21, 1973, Ser. No. 417,734
Int. Cl. B60g *11/10*
U.S. Cl. 280—104.5 A **8 Claims**



1. In a vehicle of the type having a frame and a tandem axle assembly including a leading axle, a leading axle housing, a trailing axle, a trailing axle housing, and means for driving said leading axle, an improved tandem axle suspension system comprising:

resilient support means including a pair of spring assemblies depending from said vehicle frame;

a pair of longitudinally extending load distribution beams pivotally attached in supporting relationship to respective ones of said spring assemblies;

attachment means for said leading axle housing comprising a pair of single-point attachment assemblies connecting said housing and one end of each of said load distribution beams whereby said front axle housing is free to pivot relative to said beams;

attachment means for said trailing axle housing comprising a pair of multiple-point attachment assemblies connecting said trailing axle housing and the other end of each of said load distribution beams whereby the angular position of said trailing axle housing is fixed relative to said beams; and

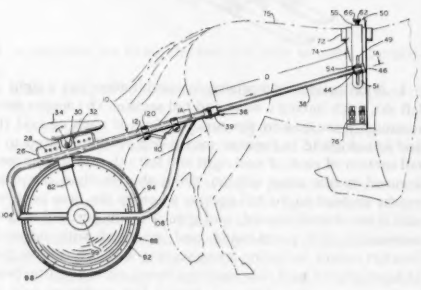
means comprising a torque arm extending between said leading axle housing and said vehicle frame for limiting rotation of said leading axle housing relative to said frame.

3,907,325

SULKY HAVING ADJUSTABLE STRUCTURE

Clarence F. Gaines, Sherburne, and Chester C. DePew, Farmingdale, both of N.Y., assignors to Clarence Gaines, Sherburne, N.Y.

Filed Nov. 29, 1973, Ser. No. 419,992
Int. Cl.[2] B62C *1/08*
U.S. Cl. 280—34 R **10 Claims**



1. A sulky comprising:

a pair of laterally spaced elongated shaft assemblies for receiving a horse therebetween; each of said shaft assemblies having a front end displacably fixed in any one of a plurality of longitudinal planes different than a rear respective end of said shaft assembly;

means for adjusting each of said shaft assemblies in length and in the distance between respective front ends thereof;

a transverse frame assembly connecting said shaft assemblies near said rear ends thereof;

means for adjusting the overall length of said transverse frame assembly so that said rear ends of said shaft assemblies are adjustably spaced apart;

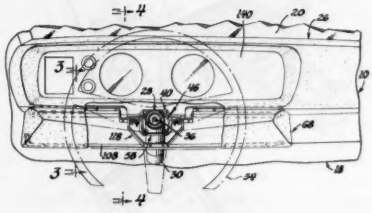
a wheel means carried at each end of said transverse frame assembly; and

a seat support carried by said transverse assembly and arranged to support adjustably on a driver's seat thereon.

3,907,326
OCCUPANT KNEE RESTRAINT

Gary L. Arntson, Lansing, and Lehman J. Connell, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 28, 1972, Ser. No. 276,084
Int. Cl.² B60R *21/00*
U.S. Cl. 280—150 B **6 Claims**

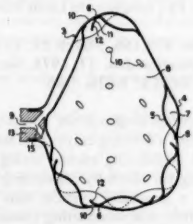


1. The combination comprising, an automotive vehicle including an occupant compartment having an instrument panel, an energy absorbing steering column assembly engageable by the upper torso of a seated driver for controlled collapse thereof, a knee restraint including first portions capable of absorbing energy by plastic deformation and located to each side of the steering column for engagement by the frontal surfaces of the knees of the driver, and a center portion interconnecting the first portions and at least partially surrounding the energy absorbing column, the plastic deformation of the first portions by the frontal surfaces of the driver's knees absorbing kinetic energy of the lower torso of the driver and applying a resultant compressive load longitudinally of the femurs of such driver within predetermined tolerance limits to control the kinematics of the upper torso of the driver with respect to the steering column assembly, means rigidly supporting the center portion on the vehicle to block deformation of the center portion into the column assembly, and means interconnecting edge portions of the first portions of the knee restraint and fixed vehicle structure to insure plastic deformation of the first portions intermediate said edge portions.

3,907,327
SAFETY DEVICE WITH AN INFLATABLE CUSHION WHICH PROVIDES EFFECTIVE PROTECTION DURING SUCCESSIVE COLLISIONS

Bernard M. Pech, Paris, France, assignor to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jan. 15, 1973, Ser. No. 323,948
Claims priority, application France, Jan. 19, 1972, 72.01805
Int. Cl.² B60R *21/08*
U.S. Cl. 280—150 AB **15 Claims**

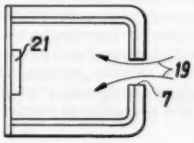


1. A safety device for protecting a passenger in a moving vehicle including successive impacts, which comprises at least one inflatable cushion, said cushion comprising two adjacent non-communicating chambers, maintained at different pressures at the time of use, the outer chamber enclosing at least partially the inner chamber, the inner chamber being capable of communicating with the atmosphere via permanent orifices of low cross-section, and via temporary orifices of large cross-section, the latter being closed by valves which open only in the direction which admits air into said inner chamber, the outer chamber being connected to a source of gas under pressure, a collision detector controlling the actuation of said gas, the walls of said two chambers being of flexible material of substantially equal dimensions and located one inside the other, connected together in a discontinuous manner by leakproof contact zones distributed over a substantial area of said walls, said permanent and temporary orifices being machined at said leakproof contact zones, the outer chamber expanding and re-expanding the cushion when it is pressurized, the inner chamber being expanded by pressurization of the outer chamber and being pressurized itself by sucking in air from the surrounding atmosphere via the temporary orifices of large cross-section, the inner chamber being depressurized by escape of air through the permanent orifices during the stage when the passenger presses against said cushion, the gas passage taking place at a low flow rate in the direction from the interior of the inner chamber to the surrounding atmosphere, for the purpose of deadening the person to be protected when the latter is thrown against the said cushion during an accident, and at a higher flow rate in the direction from the surrounding atmosphere to the interior of the inner chamber for the purpose of rapidly re-inflating the said cushion as soon as the latter is no longer acted upon by the person to be protected.

3,907,328
INFLATABLE AIR BAG FOR MOTOR VEHICLES FOR ATTENUATING THE IMPACT EFFECT OF THE PASSENGER IN CASE OF ACCIDENT

Per Olof Werman, Stockholm, Sweden, assignor to Klippan G.m.b.H. Hamburg, Hamburg, Germany

Division of Ser. No. 152,129, June 11, 1971, Pat. No. 3,788,663. This application June 14, 1973, Ser. No. 370,087
Claims priority, application Germany, June 20, 1970, 2030518
Int. Cl.² B60R *21/08*
U.S. Cl. 280—150 AB **1 Claim**



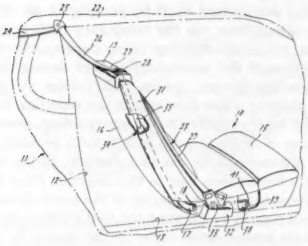
1. In an inflatable air bag disposed within the passenger compartment of a motor vehicle subject to impact and adapted for inflation with fluid supplied in part from a cartridge upon impact of the vehicle, the improvement wherein said bag has (a) a plurality of U-shaped tubes, each of said tubes being connected at one end to the cartridge and being disposed within said bag, (b) at least one air intake opening provided in the front wall thereof, and (c) closure means operably associated with said air intake opening for automatically sealing said air intake opening after inflation of said bag, said closure means comprising an inflatable tube having a free end which, upon inflation of said tube, extends through and seals said air intake opening.

3,907,329

SHOULDER HARNESS POSITIONER

Jeffrey A. Erion, Dearborn Heights, and Richard E. Peel, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 30, 1974, Ser. No. 502,113
Int. Cl.[2] B60R 21/10
U.S. Cl. 280—150 SB 4 Claims



1. A shoulder harness positioner for use in a motor vehicle having body structure defining a passenger compartment and a forwardly facing passenger seat assembly mounted within the compartment,

the seat assembly having a seat cushion structure a backrest structure forwardly tiltable about an axis adjacent the rear end of the seat cushion to provide an enlargeable passageway to the compartment space rearwardly of the seat assembly, and a vertically adjustable headrest supported on the upper end of the backrest structure,

a first guide loop located within the passenger compartment above and rearwardly of the seat assembly,

and a shoulder harness extending from the first guide loop through the second guide loop downwardly over the backrest structure to a nondetachable connection with a lap belt coupled to a rectractor mounted on the body structure at the outboard side of the seat assembly,

a segment of the shoulder harness between the first and second guide loops normally extending angularly across the passageway in position to interfere with access to the latter,

wherein the improvement comprises:

a lift means having a lift member telescopically extending through guide means in the backrest structure and headrest,

the guide means being movable with the headrest relative to the backrest structure,

and extension member slidably axially projecting from the lift member and supporting the second guide loop above the headrest,

interlocking means on the lift member and extension member permitting limited axial movement of the extension member relative to the lift member,

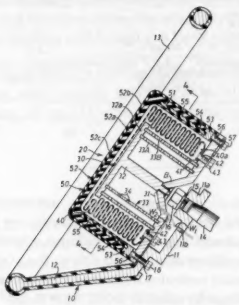
the lift means in response to forward tilting movement of the backrest structure being movable in the guide means to raise the extension member and second guide loop to lift the shoulder harness out of interference with the passageway to the compartment rear space.

3,907,330

SAFETY APPARATUS FOR STEERING WHEEL ASSEMBLY

Yutaka Kondo, and Shuho Nishina, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 15, 1974, Ser. No. 524,263
Claims priority, application Japan, Dec. 3, 1973, 48-139085
Int. Cl.[2] B60R 21/10
U.S. Cl. 280—150 AB 10 Claims



1. In a safety apparatus for a steering wheel assembly of a vehicle having a collision senser and a fluid pressure source for activating said safety apparatus in response to a signal generated from said senser, comprising a base plate mounted on the hub member of said steering wheel assembly, an inflatable bag assembled on said base plate to be inflated by pressurized fluid from said pressure source, and a container mounted on said base plate to contain said inflatable bag therein,

the improvement wherein said container comprises a breakable pad body mounted on said base plate to cover said inflatable bag and a separable cylindrical core element inlaid within the side wall of said pad body, said core element being formed with a plurality of plate members connected at their both sides with other plate members to be separated by said bag when inflated, each of said plate members including a transverse recess at its lower portion to be bent outwardly, whereby when said gas bag is inflated, said pad body is broken by said inflated bag and said core element is separated and bent outwardly so that the bottom portion of said inflated bag is supported by the steering wheel.

3,907,331

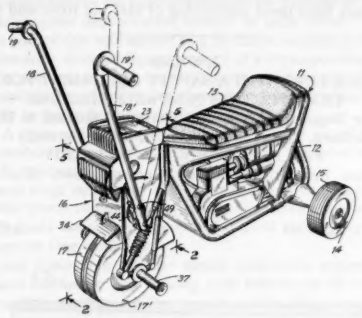
TOY VEHICHLE CONSTRUCTION

Raymond J. Lohr; Calvin S. Cook; Paul G. Goodwin, and Carl J. Merl, all of Erie, Pa., assignors to Louis Marx & Co., Inc., Stamford, Conn.

Division of Ser. No. 239,156, March 29, 1972, Pat. No. 3,874,700. This application Jan. 27, 1975, Ser. No. 544,543
Int. Cl.[2] B62K 5/06
U.S. Cl. 280—270 1 Claim

1. A toy vehicle comprising a body carrying at least one ground engaging wheel, a housing carrying at least one ground engaging wheel and connecting means acting between said body and said housing for pivotally connecting said body and said housing about a generally vertical axis whereby said vehicle may be steered, said connecting means including an extension on said body, a pair of vertically aligned and oppositely extending cylindrical hubs on said extension, a horizontally positioned wall on said housing, a cylindrical aperture in said wall, a cap removably connected to said housing and a

cylindrical recess in said cap, said cylindrical aperture and said cylindrical recess when said cap is affixed to said housing



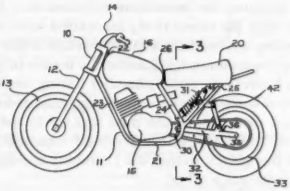
defining a pair of spaced vertically aligned journals, said cylindrical hubs being mounted in said journals.

3,907,332

SUSPENSION SYSTEM

Donald G. Richardson, 4113 Lanterman Ln., La Canada, Calif. 91011

Filed Nov. 25, 1974, Ser. No. 526,971
Int. Cl.[2] B62K *25/20*
U.S. Cl. 280—285 **10 Claims**



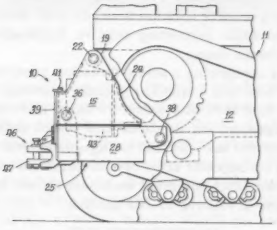
1. A suspension for two wheeled vehicles comprising:
a frame for the vehicle comprising a generally closed shape including upper and lower portions and
a swing arm pivotally connected to the lower portion of said frame;
said swing arm comprising a pair of arms rotatably supporting a wheel about a horizontal axis generally at the end of said swing arm;
the pivotal mounting of said arm to said frame being about a generally horizontal axis whereby said wheel is both rotatable about its own horizontal axis and deflectable in a generally vertical direction about the axis of said swing arm;
spring means having a first end pivotally secured to said frame;
a link member including an intermediate point pivotally mounted on said frame about an axis, parallel to the axis of said swing arm at a point spaced therefrom;
pivotal connection means between said link member and the second end of said spring;
a bar pivotally connected at one end to said swing arm and at the opposite end to said link member at a position spaced from said spring connection;
said spring, bar, swing arm and link connected whereby deflection of said swing arm displaces said bar and rotates said link member to compress said spring.

3,907,333

PINNED ON MODULAR ATTACHMENTS WITH INTERCHANGEABLE COMPONENTS

Albert Gianessi, East Peoria, and Leon Arnold Wirt, Joliet, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Oct. 7, 1974, Ser. No. 512,194
Int. Cl.[2] B62D *21/12*; **B60D** *1/00*
U.S. Cl. 280—415 R **8 Claims**



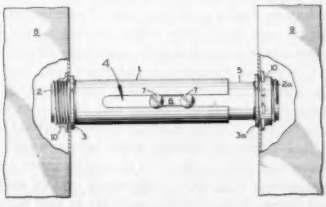
1. An earthmoving vehicle having a main frame for supporting any one of a plurality of different attachment implements thereupon and having mounting means for mounting said attachment implement upon said main frame, said main frame including at least a first pair of protruding ears integral with said main frame, first aperture means in said first pair of ears, said mounting means including first and second laterally spaced apart bracket means for supportive connection between said main frame and said attachment implement, said laterally spaced apart bracket means including second aperture means for mating alignment with said first aperture means in said first pair of ears, first pin means for being supportively received within said first and second aperture means for securing said first and second laterally spaced apart bracket means to said main frame, said main frame including third aperture means spaced apart from said first aperture means, said mounting means including cross beam means which include fourth aperture means for selective mating engagement with said third aperture means, second removable pin means for being selectively concurrently received within said third and fourth aperture means for further securing said mounting means to said main frame, said attachment implement including at least fifth aperture means for selective pinned mating aligned relation with at least one aperture means of said bracket means to selectively secure said attachment implement to said bracket means.

3,907,334

LINEAR ADJUSTABLE TELESCOPIC NIPPLE

Enos L. Schera, Jr., Miami, Fla.

Filed Nov. 4, 1974, Ser. No. 520,439
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—20 **2 Claims**



1. In a telescopic nipple for connection between a pair of electrical junction boxes, said nipple having:
an outer tubular member with a longitudinal slot therein which is open at one end of said outer member, said outer

member having an attachment portion at its opposite end for connection to a first electrical junction box;

and an inner tubular member slidably received inside said outer member, said inner member extending beyond said one end of the outer member and terminating thereat in an attachment portion for connection to a second electrical junction box;

the improvement wherein

said inner member has a radially outwardly-projecting boss thereon which is slidably received snugly in said slot in the outer member and is elongated lengthwise of said slot to prevent relative rotation between said outer and inner members while permitting relative longitudinal adjustment between them;

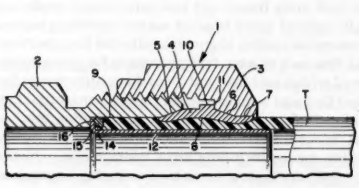
and further comprising a screw-threaded member mounted in said boss and extending radially outward therefrom through said slot, said screw-threaded member carrying an enlargement on its outer end which extends transversely across said slot and is engageable with said outer member on opposite sides of said slot when turned down to lock the outer and inner members against longitudinal displacement relative to one another.

3,907,335

TUBE COUPLING

Donald G. Burge, Plainwell, and Norris J. McPhillips, Otsego, both of Mich., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed June 3, 1974, Ser. No. 475,507
Int. Cl.[2] F16L *33/20*
U.S. Cl. 285—23 **10 Claims**



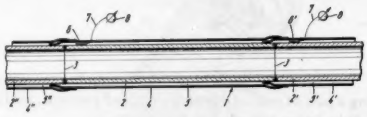
1. A tube coupling comprising a body and nipple assembly including a body having a tube receiving bore which at its axially inner end has a radially inwardly extending shoulder, a tube supporting nipple radially spaced within said body bore and extending axially outwardly therebeyond and having a radially outwardly extending flange at its axially inner end which has radial clearance with said body bore, and a retaining ring having an interference fit in said body bore and axially positioned in said body bore to frictionally grip said flange between said shoulder and the axially inner end of said ring to axially retain said nipple in said body in coaxial relation to said body bore during shipment, handling, and storage of said assembly, said ring having an inside diameter which provides a radial clearance around said nipple adjacent to said flange; a sleeve having a tube receiving bore of substantially the same diameter as said body bore which surrounds the portion of said nipple which extends axially outwardly beyond said body bore; a nut having threaded engagement with said body and having a radially inwardly extending annular surface which is engageable with the axially outer end portion of said sleeve; a deformable tube having its end portion inserted through said nut and sleeve into the annular space between said sleeve and body bores and said nipple with its axially inner end in abutting engagement with the axially outer end of said retaining ring; said nipple being radially movable in said body by radial sliding of said flange between said shoulder and said retaining ring to accommodate eccentricity between the outside and inside diameters of said tube; one of said body and nut and said sleeve having cooperating cam surfaces effective, upon screwing together of said body and nut, to radially contract an end portion of said sleeve to grip said tube against the portion of said tube supporting nipple which is within the contracted portion of said sleeve; said tube, nipple, retaining ring, and contracted sleeve being axially withdrawable as a unit from said body bore upon unscrewing of said nut from said body.

3,907,336

PIPE LINE WITH A SAFETY EQUIPMENT FOR TRANSPORTING PUMPABLE MEDIUMS

Werner Siegmund, Mannheim, Germany, assignor to Hansen Neuerburg, Export-Import GmbH, Essen, Germany

Filed Feb. 11, 1974, Ser. No. 436,193
Claims priority, application Germany, Jan. 25, 1973, 2304919
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—93 **8 Claims**



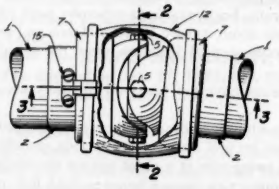
1. In a pipeline having a plurality of pipe sections interconnected by welding, there being a welding seam between respective adjacent two of said sections, with a safety equipment for transporting pumpable mediums comprising a plurality of annular chambers, each circumferentially embracing but one of the circumferential welding seams between respective two adjacent tube sections and the welded areas on both sides of said welding seam, so that the interior of each said chambers includes a single welding seam; and a plurality of leakage detectors respectively connected to the circumferential chambers and disposed for immediate response to a leak particularly of or near the respectively associated seam for detecting and indicating any medium leaking through a flaw and into the respective circumferential chamber by means of an indicating device each circumferential chamber having one end adjacent to the respectively associated welding seam and extending in longitudinal direction of the pipe line up to the area of the respectively adjacent circumferential chamber, but being separated therefrom, so that the chambers are unable to communicate with each other.

3,907,337

ANGULARLY ADJUSTABLE DUCT CONNECTOR

Stephen N. Affa, Torrence, Calif., assignor to General Connectors Corporation, Burbank, Calif.

Filed June 21, 1973, Ser. No. 372,061
Int. Cl.[2] F16L *13/04*
U.S. Cl. 285—114 **3 Claims**



1. An angularly adjustable connector for joining a pair of hot-gas transmitting ducts, said connector comprising:

a. a pair of thin wall tubular elements adapted to form contronting ends of a pair of ducts, each tubular element having radially enlarged end portions of spherical contour including a pair of diametrically disposed axial extensions

arranged in axially overlapping and circumferentially displaced relation to the extensions of the other tubular elements;

b. a ring disposed within the extensions;

c. pivot means connecting the ring and each of said extensions whereby the tubular elements are capable of universal angular displacement relative to each other;

d. a pair of thin wall spacer ring elements, each including an inwardly directed flange secured to a corresponding tubular element and a cylindrical portion concentric with and spaced from the tubular element to minimize heat transfer to the cylindrical portion;

e. A thin wall connecting member axially movable into confronting relation to the cylindrical portions of both the spacer rings;

f. seal rings interposed between the cylindrical portions of the spacer rings and the connecting member and supporting said connecting member for axial sliding along said spacer ring elements;

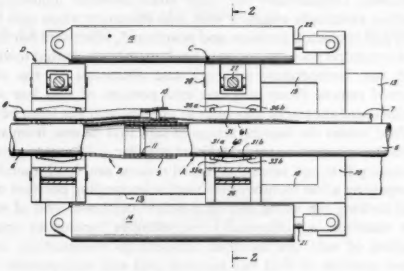
g. and removable retainer means removably mounted on said connector and limiting axial movement of the connecting member relative to said spacer ring elements.

3,907,338

CLAMP AND PRESS FOR JOINING DUAL PIPES

T. Jarrell Hayes, Jr., Spring, and David L. Gruller, Houston, both of Tex., assignors to Zapata Pipeline Technology, Inc., Houston, Tex.

Filed June 14, 1974, Ser. No. 479,303
Int. Cl.² F16L *39/00*
U.S. Cl. 285—137 R **2 Claims**



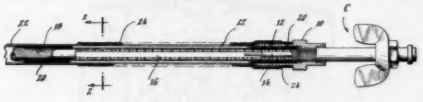
1. A clamp for gripping one pipe only of a multiple side-by-side pipe assembly comprising a pair of pivotally connected bowl-forming bodies with registering complementary cavities of sufficient diametral expanse to encompass the pipe assembly, a plurality of wedging slips in said cavities, at least first and second sets of registering complementary recesses in the inner surfaces of said slips receiving individual pipes of said assembly, and gripping teeth in the surfaces of said first set of recesses, the outer surfaces of said slips and the mating surfaces of said bowl cavities being inclined to the axis of the bowl cavities whereby, upon application of opposed longitudinal forces to said clamp and a pipe in said first recesses, said teeth will be forced radially inwardly to grip the pipe therein, there being sufficient clearance between said second slip recesses and the pipe therein to accommodate the radial wedging movement of said slips without binding of said slips against said latter pipe, and means for securing together said body bowls.

3,907,339

CRYOGENIC DELIVERY LINE

Joseph G. Stumpf, Fairfield, and Joseph F. Andera, Trumbull, both of Conn., assignors to Frigitronics of Conn., Inc., Shelton, Conn.

Filed July 23, 1973, Ser. No. 382,009
Int. Cl. F16l *39/02, 59/14*
U.S. Cl. 285—149 **10 Claims**



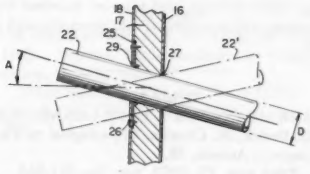
1. A cryogenic delivery line having a tubular metal connector secured to one end thereof comprising: a plastic tube connectable to a source of cryogenic fluid; a flexible insulating material covering said tube; a spiral first spring encircling said tube and insulating material and extending from said end for a first distance therealong, all of said tube, insulating material, and first spring being contained at said end within said tubular metal connector; a flexible tubular sheath enclosing said insulated plastic tube, first spring, and tubular metal connector; and a spiral second spring encircling said sheath and connector and extending from said end for a second distance along said sheath, said first and second distances being unequal.

3,907,340

FLANGE-BOILER INSULATION COVER ATTACHMENT

Robert J. George, Dallas, Tex., assignor to Forney Engineering Company, Carrollton, Tex.

Filed Apr. 8, 1974, Ser. No. 458,730
Int. Cl.² F24C *3/10*
U.S. Cl. 285—192 **7 Claims**



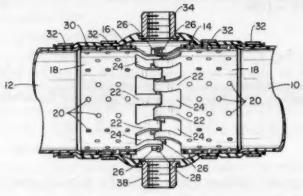
1. An improved method for protecting lagging and insulation layers of a furnace windbox wall, wherein the windbox wall has an opening for receiving a mounting tube therethrough suitably welded therein, said windbox wall covered with the insulation layer and the outer lagging layer, said lagging having a suitable opening for the projection of the mounting tube therethrough, wherein the improvement comprises the steps of:

forming a strip of material of L-shaped cross section having a relatively thin gauge, cutting the strip transversely on the L cross section along the longer end thereof, tacking a beginning end of the strip to the exterior surface of the mounting tube; bending and forming said L-shaped member about the circumference of the mounting tube to engage with the beginning thereof, forming a bead along the short end of the L-shaped member engaging with the circumference of the mounting tube for forming a weld therewith such that a flange is formed of strips of the material with radially extending projections; and thereafter suitably fastening the lagging over the windbox and attaching same to the extending radial projections of said flange, such that the opening in the lagging is secured about its periphery for protecting the lagging and intermediate insulation layer.

3,907,341
IRRIGATION PIPE AND COUPLING CONSTRUCTION

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 31926

Filed Oct. 23, 1974, Ser. No. 517,192
Int. Cl.[2] F16L 21/00
U.S. Cl. 285—236 6 Claims

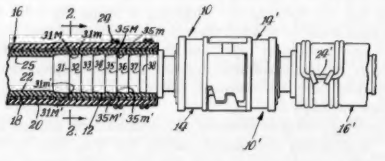


1. In a pipe and coupling construction, the combination of: two pipes having generally axially aligned and axially facing ends; metal coupling sleeves partially telescoped with and secured to said pipe ends having circumferentially spaced and axially extending finger portions generally hook-shaped in radial cross-section, said hook-shaped finger portions of said coupling sleeves circumferentially interfitting generally circumferentially aligned; a retention ring through said hook-shaped finger portions of said coupling sleeves retaining said finger portions against axial and radial separation; a cover sleeve telescoping said pipe ends axially over said coupling sleeves and said hook-shaped finger portions of said coupling sleeves; clamping means retaining said cover sleeve in said telescoping position, fluid flow voids are formed circumferentially between said coupling sleeve finger portions by said finger portion circumferential spacing remaining radially open axially adjacent certain of said finger portions after said circumferential interfitting and said circumferential alignment of said finger portions; and in which a fluid takeoff member is secured in said cover sleeve, and provides a fluid communicating passage there through, said take-off member freely fluid communicating with interiors of said pipes through said fluid flow voids.

3,907,342
BARB MEANS FOR A HOSE CONNECTOR

Edmund C. Dudek, St. Charles, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed Aug. 27, 1973, Ser. No. 391,865
Int. Cl. F16L 33/22
U.S. Cl. 285—242 3 Claims

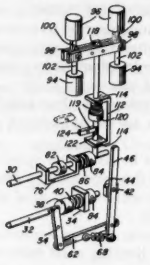


1. In a hose connector having an elongated tubular body, one end thereof forming a stem portion adapted to receive a hose and the other end thereof having a coupling portion adapted to be connected to a fluid conduit, the improvement comprising a plurality of annular barb means on said tubular body, said barb means first increasing, then decreasing and then increasing in external radial dimensions from the stem portion toward the coupling portion, the rates of increase in external radial dimensions of said barb means being different, said barb means including first and second sets of at least two barbs each, the last barb of the second set being of the largest external radial dimension and the first barb of the first set being of the smallest external radial dimension.

3,907,343
DOOR LOCKING STRUCTURE

Charles M. Goodwin, Rt. 2, Mt. Vernon, Ohio 43050

Filed Nov. 23, 1973, Ser. No. 418,196
Int. Cl.[2] E05C 1/02
U.S. Cl. 292—33 10 Claims



1. In combination, a support structure including at least one marginal edge portion, a lock assembly supported from said support structure, said lock assembly including an elongated locking bar guidingly mounted on said support structure for lengthwise reciprocation between an operative position with one end portion of said bar extended relative to said one marginal edge portion and a retracted position with said one end portion of said bar retracted relative to said one marginal edge portion, a laterally enlarged abutment carried by the other end portion of said bar for reciprocation therewith, a latch member guidingly supported from said support member for shifting toward and away from said bar laterally of the latter, first means yieldingly biasing said bar toward said retracted position, second means yieldingly biasing said latch members toward said bar; said latch member including a portion abuttingly engaged with said abutment when said bar is in said retracted position and positioned, when said bar is in said extended position and said latch member is shifted toward said bar, immediately adjacent said abutment on the side thereof remote from said one end portion of said bar and against said abutment may abut to prevent said bar from being shifted, under the biasing action of said first means, from said extended position to said retracted position, said motor means including first and second solenoid means, said latch member comprising a bar member disposed in upstanding position and said locking bar being disposed below the lower end of said bar member, a horizontal cross member having an upper portion of said bar member adjacent its mid-portion, said upper portion of said bar member and said mid-portion including coasting means establishing a one-way connection between said bar member and said cross member to lift the former in response to upward movement of the mid-portion of the cross member, said first and second solenoid means being mounted from said support structure and having their armatures connected to the opposite ends of said cross member for elevating the corresponding end of said cross member, and thus the mid-portion thereof, upon actuaction of either of said armature means.

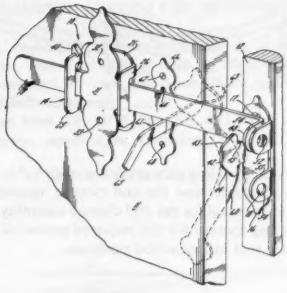
3,907,344
ADJUSTABLE ORNAMENTAL GATE LATCH

Robert L. Newlon, Rock Falls, Ill., and Benjamin Bernstein, Yonkers, N.Y., assignors to Lawrence Brothers, Inc., Sterling, Ill.

Filed Mar. 25, 1974, Ser. No. 454,430
Int. Cl.[2] E05C 5/00
U.S. Cl. 292—66 9 Claims

1. A non-handed latch for gates and the like, comprising a bilaterally symmetrical striker bar, a bilaterally symmetrical strike adapted to be secured to a fixed jamb adjacent the gate, and including means for receiving and retaining one end of the striker bar in a latched position, and bilaterally symmetrical mounting means for mounting the striker bar on the gate to be

pivoted between latched and unlatched positions, said mounting means including bilaterally symmetrical means for securing the striker bar on the mounting means in any one of a



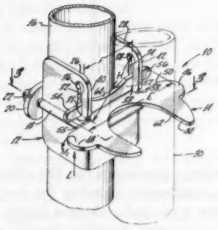
range of extended positions, the bilaterally symmetrical parts permitting the latch to be used with either a right-handed or a left-handed gate.

3,907,345

DOG KENNEL GATE LATCH

Leo J. Martini, South Gate, Calif., assignor to Master Fence Fittings, Inc., La Habra, Calif.

Filed July 1, 1974, Ser. No. 484,665
Int. Cl.² E05C *5/00*
U.S. Cl. 292—68 **7 Claims**



1. A gate latch for attachment between a gate post and an adjacent fence post, said gate latch comprising:

a holding member rigidly attached to one of said posts;

a latching member for engagement with the other of said posts;

a pair of guide slots in one of said holding member and said latching member; and

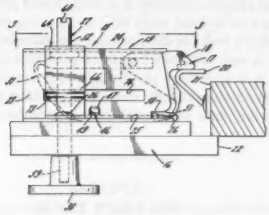
means connected to the other of said holding member and said latching member cooperating with said slots for movably mounting said latching member on said holding member, said mounting means being movable within the length of one of said slots independent of its motion in the other of said slots, said guide slots being vertical and said mounting means being a pair of end tabs, each of said end tabs slidably inserted in one of said pair of vertical guide slots, each of said pair of slots located on opposite sides of said fence.

3,907,346

POSITIVE CATCH

Mario Van Klompenburg, Owatonna, Minn., assignor to Amerock Corporation, Rockford, Ill.

Filed Feb. 4, 1974, Ser. No. 439,293
Int. Cl.² E05C *19/10*
U.S. Cl. 292—127 **13 Claims**



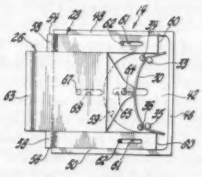
1. A catch comprising, a support, a bolt mounted on said support and having a head movable between a projected position and a retracted position, a resiliently flexible loop mounted on said support and having opposing sides with ends connected to said bolt head, said loop urging said head into said projected position, and an actuator engageable with said loop and manually operable to collapse said loop to move the head into its retracted position, said opposing sides being spaced from and extending generally parallel to each other, said loop further comprising an intermediate section connecting said sides together, said loop being constrained within said support in the general shape of a rhombus and having an elongated slot formed through one of said sides, said actuator being slidably connected to the opposite side of said loop, projecting outwardly of said support through said slot and being movable along said loop within said slot.

3,907,347

LATCH MECHANISM FOR A CLOSURE MEMBER

Lyn C. Hollis, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1974, Ser. No. 525,997
Int. Cl.² E05B *55/00*; **E05C** *1/10*
U.S. Cl. 292—169.13 **3 Claims**



1. A latch mechanism for a closure member that is supported for movement between an open position wherein said closure member is spaced from a fixed strike plate having an opening formed therein and a closed position wherein said closure member is located adjacent said strike plate, said latch mechanism comprising a housing having an outer edge, a main bolt slidably supported in said housing, said main bolt having an outer end and an inner end and being adapted to be located in a retracted position wherein the outer end of the bolt is located substantially at the outer edge of the housing, a normally extended position wherein the outer end of said main bolt is located outwardly beyond said outer edge of the housing a predetermined distance, and a fully extended position wherein the outer end of the bolt is located outwardly beyond said outer edge a distance greater than said predetermined distance, an auxiliary bolt slidably supported in said housing

adjacent said main bolt and having an outer end adapted to assume a normally extended position wherein the outer end of the auxiliary bolt extends out of said housing a distance substantially equal to said predetermined distance and a retracted position wherein the outer end of the auxiliary bolt is located substantially at the outer edge of said housing, said outer end of the auxiliary bolt adapted to contact said strike plate and be moved into and be maintained in its retracted position when said closure member is in said closed position, and a leaf spring carried by said main bolt and having portions engaging said auxiliary bolt for maintaining the main bolt and the auxiliary bolt in said normally extended positions when said closure member is in said open position and for causing the main bolt to be moved to said fully extended position into the opening in said strike plate when said closure member is in said closed position.

3,907,348

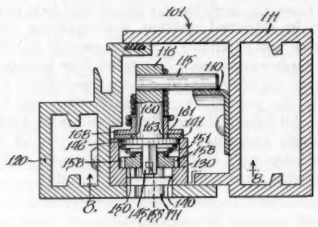
SECURITY LOCK

Wayne C. Bates, and Richard L. Moore, both of Owatonna, Minn., assignors to Truth Incorporated, Owatonna, Minn.

Continuation-in-part of Ser. No. 355,055, April 27, 1973. This application July 29, 1974, Ser. No. 492,613

Int. Cl.² E05C *3/04*

U.S. Cl. 292—220 **11 Claims**



1. A security lock for a window having a frame including a keeper and a latch engageable with the keeper, means for operating said latch relative to the keeper including a housing positioned within said frame with an internal chamber and a front wall, a bolt rotatably mounted in said housing and extending therefrom and carrying said latch and having a shaped end within said chamber, a bearing plate slidably mounted on said shaped end of the bolt and rotatable therewith, coacting notch and lug means on said front wall and bearing plate for locking said bearing plate against rotation, spring means urging said bearing plate against said front wall to maintain said coaction, and an opening in said front wall and window frame for entry of a tool to move said bearing plate against said spring means to release said slot and lug means and to engage said shaped end of the bolt for rotation of the bolt and latch.

3,907,349

END CLOSURE ASSEMBLIES FOR CONTAINERS AND IMPROVED CLOSING RINGS THEREFOR

James T. Kane, Westfield, N.J., assignor to Rings for Drums, Inc., N.J.

Filed Mar. 25, 1974, Ser. No. 454,386

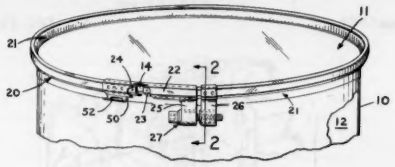
Int. Cl.² E05C *19/18*

U.S. Cl. 292—256.67 **15 Claims**

1. An end closure assembly for a container forming a material receiving chamber with at least one end opening and a rounded section about said end opening comprising:

a. an end closure for the container having an annular peripheral element shaped for mating engagement with the rounded section of the container,

b. an inner seal adhesively connected between the rounded section of the container and the annular peripheral element on the end closure, and



c. an outer sealing means of heat shrinkable material about the container and the end closure in assembled position to form a seal for the end closure assembly by heating and cooling thereof for the required period of time to set the inner seal in assembled position.

3,907,350

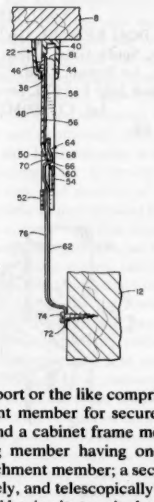
DOOR SUPPORT

Howard B. Gorton, San Gabriel; George D. Read, Glendora, and Keith E. Ridgway, West Covina, all of Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.

Filed May 17, 1974, Ser. No. 470,917

Int. Cl.² E05C *17/30*

U.S. Cl. 292—338 **15 Claims**



1. A cabinet door support or the like comprising the combination: a first attachment member for secure attachment to one of a cabinet door and a cabinet frame member; an elongate, extending housing member having one end pivotally secured to said first attachment member; a second attachment member slidably, captively, and telescopically received within said housing member and having its terminal end opposite said first attachment member for secured attachment to the other of a cabinet door and a cabinet frame member; said housing member and second attachment member having cooperative locking means to releasably lock said second attachment member in the fully extended position with respect to said housing member, said housing member being configured to form a guide path for said second attachment member and having a first side wall with a flexible wall portion extending inwardly to a locking position when said second attachment member is in said fully extended position, said second attachment member having a protuberant portion adjacent said inwardly extending wall portion of said housing member when fully extended to act in cooperation therewith to form an abutment stop for cooperative action with said inwardly extending flexible wall portion, said housing member having at least a partial side wall, opposite said first side wall, with an

inwardly extending portion disposed adjacent said second attachment member to retain said second attachment member in telescopic and captive relationship with said housing member.

3,907,351

IMPACT-DAMPING SYSTEM FOR AUTOMOTIVE VEHICLES

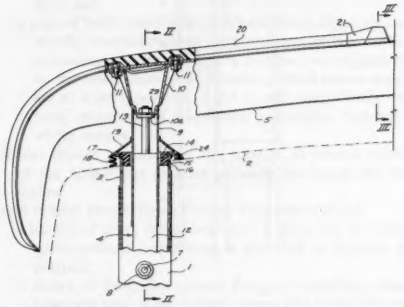
Martin Pozelt, Ingolstadt; Manfred Uebelstadt, Wettstetten; Ahlrich Dahn, and Karl Bauer, both of Ingolstadt, all of Germany, assignors to Audi Nsu Auto Union Aktiengesellschaft, Ingo'stadt, Germany

Filed Mar. 19, 1974, Ser. No. 452,561

Claims priority, application Germany, Mar. 21, 1973, 2313927

Int. Cl.[2] B60R *19/06*

U.S. Cl. 293—71 R **14 Claims**



1. In an automotive vehicle having a chassis, the combination therewith of an impact-damping system comprising:

a pair of tubular guide members rigid with said chassis extending substantially parallel to a longitudinal axis of the vehicle at an end of the vehicle body;

a horizontal bumper bar transverse to said axis spaced from said body at said end thereof;

a pair of shock absorbers having ends remote from said bumper bar pivotally joined to said guide members, respectively, for swinging in a horizontal plane;

stiff connecting means of limited deformability joining said shock absorbers to respective extremities of said bumper bar, said connecting means terminating in a pair of bases rigid with said extremities; and

a pair of slide bearings engaging said shock absorbers for holding same centered within said guide members while allowing said shock absorbers to yield to lateral stresses tending to displace said bumper bar in said horizontal plane.

3,907,352

BREAK AWAY FRONT TRUCK BUMPER

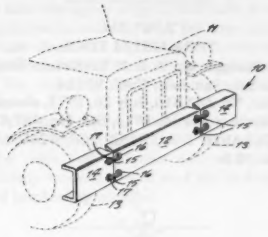
William H. Spain, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Feb. 12, 1974, Ser. No. 441,764

Int. Cl. B60r *19/04*

U.S. Cl. 293—76 **2 Claims**

1. A break away bumper assembly for a motor vehicle, comprising a central bumper mounted rigidly on the front end of the vehicle extending to planes parallel to and spaced from the inner surfaces of the front wheels of the vehicle in combination with a pair of extensions attached to opposite ends of said central bumper by frangible bolts secured to the central bumper and to each extension, wherein each bolt overlaps adjacent portions of the central bumper and each extension, said extensions projecting from the opposite ends of the central bumper to vertical planes parallel to and outward of the outer surfaces of the front wheels wherein the extensions and the central bumper have front surfaces in planar alignment and include aligned lugs mounted on said surfaces to receive



said bolts spaced from and parallel to said surfaces, whereby collision impact on said extensions will break the bolts causing the extensions to fall away from the central bumper for possible further usage thereon.

3,907,353

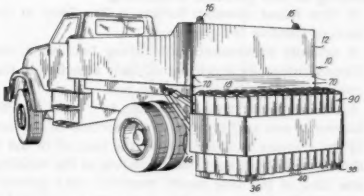
ADJUSTABLE BUMPER INCLUDING PROTECTION AGAINST UNDER-RIDE

Arthur M. Dinitz, 6 Rustic Ln., Westport, Conn. 06880

Filed May 13, 1974, Ser. No. 469,670

Int. Cl.[2] B60R *21/14*

U.S. Cl. 293—81 **8 Claims**



1. An adjustable, protective bumper for a vehicle, or the like, having an elevated body, designed and adapted to protect against under-ride and to dissipate energy upon impact; the bumper comprising:

A. a hanging support structure comprising connecting means for coupling the same to the rear portion of the elevated body;

B. a lower rigid structure comprising a plurality of vertically aligned rigid members, adjustably connected to and extending downwardly from the support structure, the adjustable connection permitting the vertical adjustment of the lower structure;

C. support means for supporting energy-dissipating, impact-protection means, the support means being connected to the lower rigid structure;

D. a plurality of reinforcing struts, each strut being designed and adapted to form a triangulated reinforcement for the lower rigid structure, one portion of each strut being connected to the lowermost portion of the lower rigid structure, a second portion of each strut being connected at a second, more elevated location on the lower rigid structure, and a third portion of each strut being designed and adapted to be connected adjacent the lower portion of the elevated body; and

E. adjustment means for each strut, designed and adapted to permit varying the length of each strut between the portions connected to the lower rigid structure and the third portion;

whereby, the lower rigid structure can be maintained at a desirable attitude with respect to the ground, regardless of the attitude of the vehicle, by adjusting the adjustment means.

3,907,354

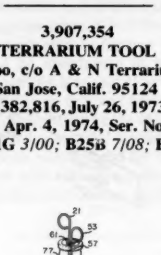
TERRARIUM TOOL

Armando V. Ocampo, c/o A & N Terrarium Tool Company, 5979 Hasta Ln., San Jose, Calif. 95124

Division of Ser. No. 382,816, July 26, 1973, abandoned. This application Apr. 4, 1974, Ser. No. 457,926

Int. Cl.[2] A01G *3/00;* **B25B** *7/08;* **B26B** *13/26*

U.S. Cl. 294—19 R **3 Claims**



1. A remote manipulating device adapted to be straightenable so that it can pass through the neck of a narrow necked transparent terrarium bottle having soil therein for the growing of miniature enclosed gardens, said device being useful for the tending of said gardens, comprising:

1. A first linear member having a first loop at one end thereof suitable for gripping;
2. A scissors movement tool having two arms, one arm thereof integrally and longitudinally attached to the other end of the first linear member; and
3. A second linear member having two ends, pivotally attached at one end thereof to the second of the two arms of the scissors movement tool, the second of the ends of the second linear member extending to the vicinity of the one end of the first linear member, said second linear member having a second loop at said second end thereof suitable for gripping, said second linear member further having an eye extending from said second loop around said first linear member, said eye serving to restrict the path of motion of said second loop to be substantially parallel to said first linear member, the length of said first linear member being at least about five times the length of said second of the arms of said scissors movement tool, the second loop being at least about three-quarters of an inch closer to the scissors movement tool than is the first loop, both the first loop and the second loop being adapted for manipulation from without said terrarium bottle adjacent the narrow neck thereof, said remote manipulating device being substantially straight when said second loop is moved to its closest approach to said first loop so that said scissors movement tool can pass through the neck of the narrow neck bottle and be manipulable by motion of said second loop relative to said first loop as constrained by said eye for tending said gardens.

3,907,355

SPEAR GUIDE MECHANISM FOR USE IN MULTIPLE TUBING WELL CASINGS

William F. Carothers, 1301 Conti, Houston, Tex. 77001

Filed Mar. 27, 1974, Ser. No. 455,473

Int. Cl.[2] E21B *31/02*

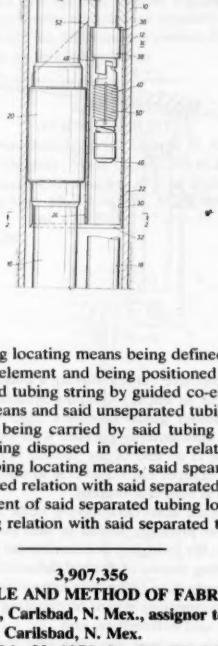
U.S. Cl. 294—86.1 **15 Claims**

1. A spear guide mechanism for establishing connection with a separated tubing string within a well having a casing and having a plurality of tubing strings disposed within said casing for production of well fluid from a plurality of production zones, said spear guide mechanism comprising:

a tubing retrieval element adapted to be lowered into said casing;

means for raising and lowering said tubing retrieval element relative to said casing;

guide means adapted to position said tubing retrieval element within said casing and being received in guided engagement by an unseparated tubing string within said well;



separated tubing locating means being defined by said tubing retrieval element and being positioned for receiving said separated tubing string by guided co-engagement of said guide means and said unseparated tubing string; and spear means being carried by said tubing retrieval element and being disposed in oriented relation with said separated tubing locating means, said spear means moving into secured relation with said separated tubing string upon movement of said separated tubing locating means into receiving relation with said separated tubing.

3,907,356

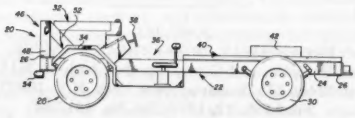
MINE VEHICLE AND METHOD OF FABRICATION

Gerald Bruce Sien, Carlsbad, N. Mex., assignor to Sien Equipment Company, Carlsbad, N. Mex.

Filed Feb. 22, 1973, Ser. No. 334,769

Int. Cl.[2] B62D *27/00*

U.S. Cl. 296—28 F **1 Claim**



1. A mine vehicle including:

a pair of spaced apart, longitudinally disposed tubular structural members each extending substantially the entire length of the vehicle and having predetermined height and width dimensions;

at least two spaced apart, transversely disposed generally I-shaped beams each comprising a generally vertically extending web and upper and lower generally horizontally extending flanges with the flanges extending beyond the ends of the webs to define generally C-shaped notches at the opposite ends of each beam,

said flanges of the beams comprising upper and lower surfaces which are spaced apart by a distance substantially equal to the height dimension of the rectangular members;

said flanges of the beams each extending beyond the ends of the webs of the beams by a distance substantially equal to the predetermined width dimension of the tubular members;

said tubular structural members being received in the notches of the beams between the flanges thereof and engaging the ends of the webs and secured in said notches to define the frame of the vehicle;

a grille assembly mounted at the front end of the frame of the vehicle and comprising:

a pair of channel members each extending substantially vertically from one of the tubular structural members; a channel member extending transversely between the upper ends of the vertically extending channel members; and

a pair of brace members each extending angularly downwardly and rearwardly between one of the vertically extending channel members and the rectangular tubular member situated thereunder; wheel means supporting at least a portion of the frame; said tubular structural members of the frame extending between the wheel means; and

fender means mounted on the tubular structural members of the frame and at least partially enclosing the wheel means;

said fender means being further characterized by:

a length of sheet metal bent into a generally box-shaped configuration comprising a plurality of spaced apart corners;

a series of inwardly turned flanges extending along at least one side of the fender means and welded together at points corresponding to the corners thereof; and

a plurality of reinforcing members each secured on the inside of the fender means at one of the corners and each welded to the adjacent portions of the inwardly turned flanges for reinforcing the corners of the fender means.

3,907,357

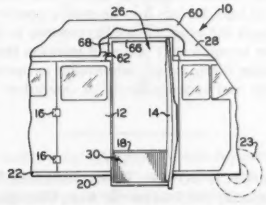
VAN STEP WELL CONSTRUCTION

William F. Davis, Jr., 193 North St., Rittman, Ohio 44270

Filed July 5, 1973, Ser. No. 376,272

Int. Cl. B60r *3/00*

U.S. Cl. 296—146 **3 Claims**



1. In a van-type vehicle having a roof with a downwardly extending side edge, a side door, a floor panel, and a rocker panel beneath the side door, a vehicle frame means, and a second side door, the improvement comprising:

a step well means operatively engaging the vehicle frame means and positioned behind the second side door,

said second side door extending below the rocker panel of the vehicle,

means positioning said second side door for opening the same to expose said step well means,

said vehicle frame means including a roof rail extending along the lower edge of said roof,

said vehicle roof including an opening formed in the lower portion of its side edge at a vertically higher portion of the vehicle than the upper edge of said side door but which opening forms a continuation of the door opening for said second side door, said second side door having an upper section thereon filling the roof opening when the door is closed but exposing such opening when the door is opened,

said roof opening including a roof rail continuation section positioned at the margins of said roof opening to reinforce the same and said roof rail continuation section being fixedly secured to said roof rail to form a continuous roof reinforcing member.

3,907,358

DOOR FOR PASSENGER MOTOR VEHICLES

Bela Barenyi, Maichingen, and Hermann Renner, Magstadt, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Nov. 24, 1972, Ser. No. 309,482

Claims priority, application Germany, Nov. 26, 1971, 2158709

Int. Cl. B60j *5/04*

U.S. Cl. 296—146 **27 Claims**

1. A vehicle door comprising

an inner door panel means,

an outer door panel means, said inner door panel means being spaced from said outer door panel means such that said inner and outer door panel means are on opposing sides of an extension of the plane of a vehicle door window, and

a closed hollow reinforcing bearer means extending in a longitudinal direction along a lower edge of said inner door panel means such that vehicle passengers are protected from lateral impacts against the vehicle door, said hollow bearer means projecting from said inner door panel means into a vehicle interior space.

3,907,359

FOLDABLE CHAIR

Cosby D. Joiner, 225 New Rodes St., New Rodes, La. 70760

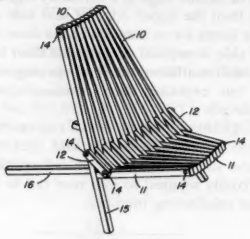
Filed Nov. 26, 1974, Ser. No. 527,239

Int. Cl.[2] A47C *4/08*

U.S. Cl. 297—18 **5 Claims**

1. A foldable chair comprising primary back members joined together proximate their top, secondary seat members joined proximate their front ends, intermediate seat members interlaced between said primary and secondary members and hingedly joined to each member, and leg members interlaced with said primary and secondary members and hingedly se-

cured to said intermediate members and extending beyond said primary and secondary members and being of a length



sufficient to support the primary, secondary and intermediate members above the ground or floor.

3,907,360

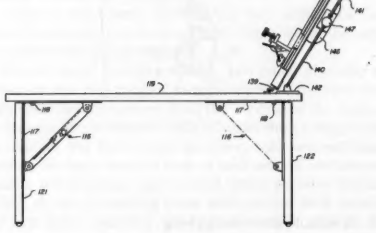
ARTIST'S HORSE

Anzelm A. Czarnowski, 12413 S. Moody Ave., Palos Heights, Ill. 60463

Continuation-in-part of Ser. No. 125,775, March 18, 1971. This application June 29, 1972, Ser. No. 267,487

Int. Cl.[2] A47C *9/00*

U.S. Cl. 297—156 **2 Claims**



1. A collapsible assembly for art work or the like, including an elongated bench having a top and a bottom,

a solid panel support leg member pivotally mounted at one end of the bench, a female cutout in the bottom of said leg member, a support point on each side of said cutout, another solid panel support leg member pivotally mounted at the opposite end of the bench, a single support point on a male portion mating with said female cutout portions when the legs are collapsed inboard alongside the bottom of said bench,

means to fix said legs in a fixed, extended position,

a pivot assembly mounted to the top of said bench toward one end thereof,

means to fix the pivot assembly in a selectively pivoted position, an elongated rod pivoted to the top surface of the elongated bench, a locking member mounted to the back face of an elongated easel member, a passageway of the locking member slidably receiving said rod, and means to selectively lock the rod in the passageway,

said elongated elongated easel member having a front supporting face for an illustrating work piece and a back face, the bottom portion of said easel member secured to at least a part of said pivot assembly so that said easel member may be positioned and locked at a selected angle relative to the top of said bench, said easel member being movable inboard to a position alongside the top of said bench and lockable in said position,

a top abutment member slidably positioned on said easel member to contact a top edge of the illustrating workpiece and depending means on said top abutment member to overlap the top of the illustrating workpiece, and a bottom abutment member slidably positionable along the length of said easel member to hold a bottom edge of the illustrating workpiece, and a spring urged friction head engageable with the front face of said easel member to fix said bottom abutment member in a selected position on said easel member.

3,907,361

CONTROL MEANS FOR THE POSITION OF A VEHICLE SEAT

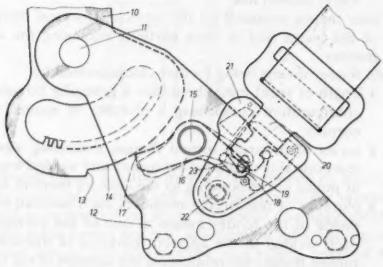
Gerhard Lehmann, Remscheid, Germany, assignor to Fritz Keiper, Remscheid, Germany

Filed Feb. 6, 1974, Ser. No. 440,035

Claims priority, application Germany, Feb. 8, 1973, 2306088

Int. Cl. A62b *35/00*; **A47c** *3/02*

U.S. Cl. 297—385 **10 Claims**



1. Control means for a tiltable vehicle seat having a back member and a seat member, comprising a first strap member secured to said back member; a second strap member secured to said seat member; first means for pivoting said strap members relative to one another between an upright end position and a reclining end position through a plurality of adjustable intermediate tilting positions; a releasable system of stop and striker devices, one device being provided on said first strap member and the other on said second strap member; second means which is intended to be operated by a user of the vehicle before the vehicle begins to move; and third means for placing one of said devices into operative position thereof in which it engages the other device in response to tilting of said back member towards said reclining position through only a part of its entire tilting range, subsequent to operation of said second means and independently of operation of said first means.

3,907,362

KNOCK DOWN CHAIR ASSEMBLY

H. Walter Zerlaut, 1055 Granville Ave., Chicago, Ill. 60626

Filed June 22, 1973, Ser. No. 372,486

Int. Cl. A47c *4/02*, *7/54*

U.S. Cl. 297—440 **4 Claims**

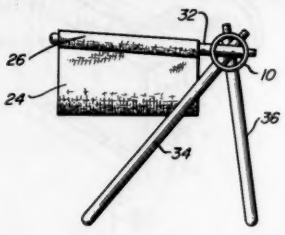
1. A knock down chair assembly including

a tubular housing,

at least five pairs of oppositely aligned mounting apertures in said tubular housing,

at least five elongated supports positionable within said housing, the major length of each of the supports being disposable within said tubular housing, each support having corss sectional portions conforming to the configuration of said mounting apertures so that each of said

supports may be moved through and engage each of the opposite aligned mounting apertures in a pair, two of said support members operable as arm supports and at least three support members operable as support legs, one end of each elongated support has a reduced width spaced by a shoulder from the body of the elongated support, each oppositely aligned pair of mounting apertures have one large aperture to accommodate the body of the elongated support member and a small aperture to accommodate the reduced width portion of each elongated support



member, each reduced width portion having an opening, and which assembly further includes a lashing member to tie all the elongated support members by passing through the opening in each reduced width portion extending out of the tubular housing, and

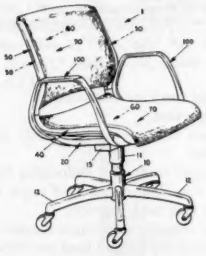
a flexible seat member wrappable around said elongated arm supports within said housing, opposite ends of said seat member provided with means to mount said seat member to said supports which are operable as arm supports.

3,907,363

UPHOLSTERY SYSTEM

Richard H. Baker, and Robert C. Clawson, both of Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 22, 1974, Ser. No. 463,191
Int. Cl.² A47C *1/02*
U.S. Cl. 297—445 **13 Claims**



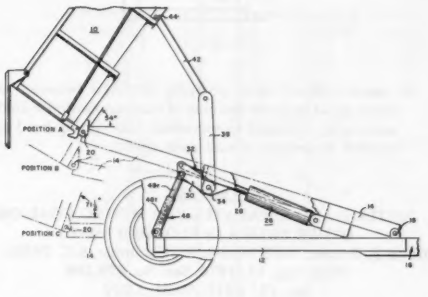
1. A chair comprising: a formed, plastic supporting seat and back means; a formed plastic inner seat and back means having a configuration conforming generally to that of said supporting seat and back means; support means for supporting said supporting seat and back means; said supporting seat and back means including at least a front edge along the front of the seat portion thereof and a top edge along the top of the back portion thereof; said inner seat and back means including at least a front lip along the front of the seat portion thereof extending over and matingly embracing said front edge of said supporting seat and back means and a top lip along the top of the back portion thereof extending over and matingly embracing said top edge of said supporting seat and back means; one of said front lip and said front edge including at least one projection integrally molded thereto and projecting therefrom, the other of said front lip and said front edge including an integrally molded receiving aperture adapted to matingly receive said projection; and one of said top lip and said top edge including at least one projection integrally molded therewith and projecting therefrom and the other including an integrally molded receiving aperture adapted to receive said projecting whereby said inner seat and back means are secured to said supporting seat and back means.

3,907,364

DUMP VEHICLE

Bernard J. Hnath, P.O. Box 47, Ashland, Wis. 54806

Filed Mar. 23, 1973, Ser. No. 344,110
Int. Cl.² B60P *1/34*
U.S. Cl. 298—11 **7 Claims**



1. A dump vehicle comprising, in combination, a mobile main frame, an elongate sub-frame connected at its forward end portion for swinging motion in upward direction to one of a plurality of angular positions of inclination with respect to the main frame, a dump body assembly connected at its rearward end portion to the rearward end of the sub-frame both for swinging motion independently of the sub-frame to one of a plurality of lift heights and also for swinging motion therewith, and power means carried by the sub-frame for applying lift force to the forward end of the dump body to first pivot the dump body on the sub-frame and thereafter lift it and the attached rearward end portion of the sub-frame whereupon both dump body and sub-frame swing in unison to a desired lift height.

3,907,365

TUNNEL DRIVING APPARATUS

Hans Gunter Follert, Dortmund, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Continuation of Ser. No. 270,311, July 10, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,219
Int. Cl.² E29C *29/00*
U.S. Cl. 299—31 **9 Claims**

1. A tunnel driving apparatus comprising:

a. a hollow substantially cylindrical outer shield having an open front end;

b. a hollow substantially cylindrical inner shield having an open front end, said inner shield being telescopically assembled within said outer shield;

c. means for axially extending and retracting said inner shield relative to said outer shield;

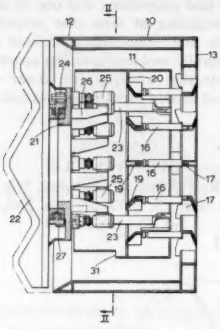
d. guide means for preventing rotation of said inner shield relative to said outer shield during axial travel;

e. A cutting head having cutting tools mounted on the front face of said cutting head;

f. means for rotatably supporting and for revolving said cutting head at the open front end of said inner shield;

g. a plurality of rods universally jointed at their front ends of said cutting head supporting and revolving means, said

plurality of rods being jointed at their rear ends to said inner shield; and



h. piston-cylinder units pivotally attached between said inner shield and said plurality of rods, said piston-cylinder units being actuated to reposition said cutting head axis relative to the axis of said inner shield.

3,907,366

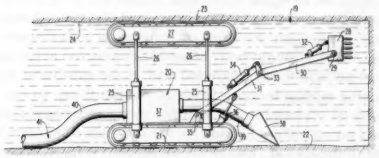
METHOD AND APPARATUS FOR MINING COAL OR OTHER SOLIDS IN FLOODED MINES

David R. Pender, 1018 Marion St., Columbia, S.C. 29201

Filed Aug. 11, 1974, Ser. No. 478,298

Int. Cl.[2] E21C *35/20, 35/24*

U.S. Cl. 299—18 **12 Claims**



1. A method of mining subterranean solids comprising the steps of forming an inclined subterranean mine shaft and entranceway and forming a required number of subterranean approximately level branch mine tunnels at different levels below ground surface and leading from the inclined mine shaft and communicating therewith, completely flooding the inclined mine shaft and said tunnels with water introduced near ground level into the mouth of said mine shaft, digging solids from said tunnels in succession while the tunnels and shaft continue to be flooded with water, and then pumping a slurry of flood water and mined solids from successive tunnels and upwardly through said flooded shaft to an above ground receiver for said mined solids.

3,907,367

COAL BREAKER COMBINED WITH LONGWALL DRUM

Shigeo Nakajima, Kushior, Japan, assignor to Taihelyo Coal Mining Co., Ltd., Tokyo, Japan

Filed July 8, 1974, Ser. No. 486,423

Int. Cl.[2] E21C *25/10*

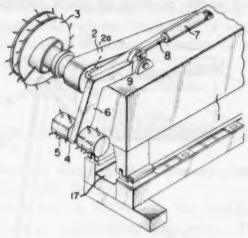
U.S. Cl. 299—53 **1 Claim**

1. In cutting equipment with a front part designed to cut the face of a coal mine, in combination:

a. an elongated narrow rectangular housing (1) with longitudinal sides, a front, rear and top;

b. a cutter arm (2) extending along said side with one end rotatably mounted on said side at said rear said arm extending toward said front and supporting a face cutting roller (3) with two peripheral edges with teeth along both peripheral edges said cutting roller serving to cut into the face of a coal bed drive means (2a) extending from said housing (1) to said roller (3) to drive said roller;

c. a breaking roll (5) with a cylindrical breaking face disposed at said front including separate swinging arm means (6) disposed over the top to support said breaking roll to lift said breaking roll and crush it down on a lump



of coal, long offset teeth extending across the full breaking face, said arm means including a bend elbow outer end supporting said breaking roll at the center thereof, a hinged inner end on said top towards the front, a crank lever on said arm, a piston rod (8) and cylinder (7) disposed on said top, said cylinder being connected to said crank lever at one end and to the housing on said top at the rear at the other end.

3,907,368

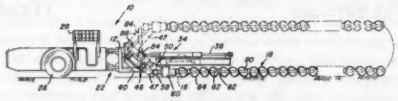
KERF CUTTING MACHINE

Alex J. Galis, 682 Killarney Dr., Morgantown, W. Va. 26505

Continuation-in-part of Ser. No. 304,503, Nov. 7, 1972, abandoned. This application Apr. 9, 1974, Ser. No. 459,291

Int. Cl.[2] E21C *25/68*

U.S. Cl. 299—57 **11 Claims**



1. A kerf cutting machine comprising,

a mobile body portion,

propelling means for moving said body portion over the floor of a mine,

a plurality of auger means for dislodging the solid material from a mine vein, said plurality of auger means rotatably supported on said body portion,

drive means for rotating said auger means,

a carriage mounted for longitudinal movement on said body portion,

a support frame having a longitudinal axis and surrounding said body portion,

said auger means rotatably supported on said support frame and arranged to pivot about the vertical axis relative thereto laterally toward and away from said body portion, said auger means being connected to said support frame for pivotal movement about said longitudinal axis thereof, a linkage mechanism for connecting said carriage to said support frame to raise and lower said auger means in a vertical plane relative to said body portion,

said support frame being pivotally connected to said linkage mechanism for tilting the forward end portion of said auger mechanism relative to said linkage mechanism such that the forward end portion of said auger means moves in a linear vertical path, and

means for conveying dislodged material from the face of the mine vein.

3,907,369

METHOD FOR SHARPENING A SKATE WHEEL

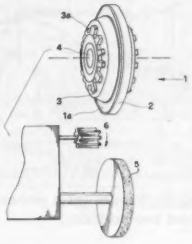
Jean Chevaux, Renens, Switzerland, assignor to Roll-Rink S.A., Switzerland

Filed Sept. 14, 1973, Ser. No. 397,275

Claims priority, application United Kingdom, Sept. 18, 1972, 43145/72

Int. Cl.[2] A63C *17/22*

U.S. Cl. 301—5.3 1 Claim



1. A method for sharpening a skate wheel mounted on a skate, said skate wheel having a ground engaging peripheral face requiring periodic sharpening and a pair of opposed sides, at least one of said sides being exposed, and a group of gear-like teeth secured to said exposed side of said wheel body, said method comprising the steps of: engaging said gear-like teeth with a power driven gear for rotating said wheel, and applying sharpening means against said peripheral face thereby sharpening the skate wheel without removal of said wheel from said skate.

3,907,370

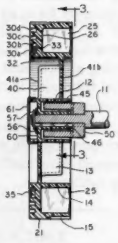
PLASTIC WHEEL CONSTRUCTION FOR UTILITY VEHICLES

Bernard D. Bard, Glencoe, Ill., assignor to Creatron Industries, Inc., Winnetka, Ill.

Filed May 1, 1974, Ser. No. 465,870

Int. Cl.[2] B60C *7/24*; B60B *5/00*

U.S. Cl. 301—63 R 6 Claims



1. A vehicle wheel, comprising:

a. hub means,

b. web means formed unitarily with and extending radially from said hub means to an annular inner rim, and

c. a tire section encircling said annular inner rim and formed unitarily therewith,

d. said tire section including a series of annularly spaced fins extending radially of the wheel's axis and lying in planes generally perpendicular to the plane of the wheel,

e. said tire section including an annular outer rim connected to said annular inner rim by said series of fins,

f. said annular outer rim defining a tread for said wheel.

3,907,371

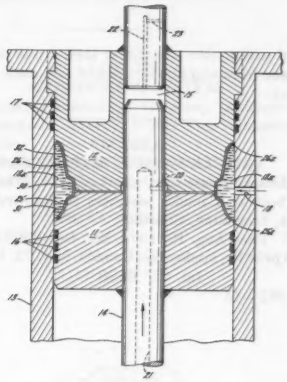
DROP CENTER TRUCK RIM AND METHOD OF FORMING SAME

Hans Luedi, Highland Park; Vernon Fencl, Northbrook, and Johann T. Hess, Deerfield, all of Ill., assignors to Grotnes Machine Works, Inc., Chicago, Ill.

Filed Dec. 23, 1974, Ser. No. 535,359

Int. Cl.[2] B60B *21/00*, *25/00*

U.S. Cl. 301—96 12 Claims



1. A method of forming a drop center truck rim from a flat steel strip rolled into the form of a smooth cylinder and welded together along the abutting axial edges, said method comprising the steps of

positioning a die along the internal surface of the cylinder, said die forming a circumferential well adjacent the central portion of the cylinder, applying fluid pressure to the external surface of the cylinder while applying a compressive axial load to the ends of the cylinder to deform the cylinder radially inwardly against the internal die and thereby form a circumferential well in the central portion of the cylinder.

12. A drop center truck rim formed by rolling a flat steel strip into the form of a smooth cylinder and welded together along the abutting axial edges of the strip, removing weld flash from the smooth cylinder, applying external fluid pressure to the smooth cylinder while applying a compressive axial load to the ends of the cylinder to force the cylinder radially against an internal die and thereby form a circumferential well in the central portion of the cylinder, shear forming the low stress areas of the desired rim profile so as to reduce the thickness of the steel cylinder in such areas, and roll forming the other areas of the desired rim profile so as to retain the original thickness of the steel strip in such areas.

3,907,372

SPOKED WHEEL

Leonard Goldberg, 429 E. Smith St., Kent, Wash. 98031

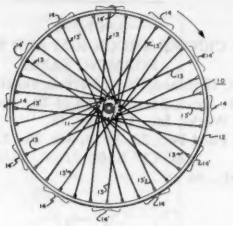
Filed Aug. 8, 1974, Ser. No. 487,519

Int. Cl.[2] B60B *1/00*

U.S. Cl. 301—104 3 Claims

1. In a spoked wheel having a hub, an annular concentric rim, and static spokes and pulling spokes equidistantly fastened at said hub and said rim, said static spokes lying at an acute angle to radii from said hub in the direction of rotation,

and said pulling spokes crossing said static spokes lying at an acute angle to said radii against the direction of rotation, a

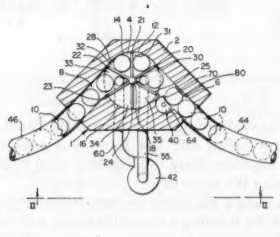


pattern of said spokes wherein at least a pair of said pulling spokes issue from said hub for each of said static spokes about said wheel.

3,907,373
ARTICLE PASSING ROTARY SEAL

Erik J. Jensen, Edmonton, and Leslie M. White, Sherwood Park, both of Canada, assignors to Research Council of Alberta, Edmonton, Canada

Filed Aug. 19, 1974, Ser. No. 498,310
Claims priority, application Canada, Nov. 22, 1973, 186496
Int. Cl.² B65B *53/30*
U.S. Cl. 302—14 **8 Claims**



1. An article passing, rotary seal for a fluid pressurized pipeline, comprising:

a. a casing having a cylindrical cavity, and an inlet port and outlet port for conveying articles in substantially tangential directions to and from the cylindrical cavity, the inlet and outlet ports being angularly spaced around the cylindrical cavity so that the curved perimeter thereof is divided approximately equally on both sides of the inlet and outlet ports,

b. a rotor rotatably mounted in the casing and having at least six arm portions radially extending from, and equally spaced around, the axis of rotation of the rotor with the arm portions in sliding contact with the casing internal surface and forming an even number of article conveying compartments each large enough to receive only one article at a time from the inlet port into the cylindrical cavity and deliver it out of the cylindrical cavity to the outlet port,

c. driving means connected to the rotor for driving the rotor,

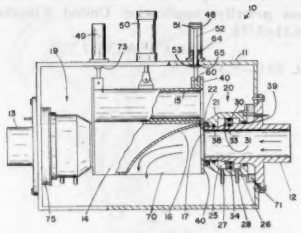
d. article delivering means, connected to the casing, for successively delivering articles to the inlet port in synchronism with the article conveying compartments being adjacent the inlet port, and

e. pumping means, connected to the casing, for withdrawing fluid from each article conveying compartment when it is adjacent the inlet port, thereby drawing an article into that compartment.

3,907,374
SWITCHES FOR CONVEYOR TUBES

James K. Steele, St. Paul, Minn., assignor to Dynamic Air Inc., St. Paul, Minn.

Filed Feb. 11, 1974, Ser. No. 441,234
Int. Cl.² B65G *53/56*
U.S. Cl. 302—28 **2 Claims**



1. A switching mechanism for a pneumatic conveying system having at least two positions;

a housing;

a first pneumatic conveying tube mounted to said housing, said first pneumatic conveying tube operable for pneumatically transporting material therein;

a second pneumatic conveying tube operable for pneumatically transporting material therein;

a member movably mounted to said housing and operable by a power cylinder, said member having at least two conveying attachment sections therein, one of said conveying attachment sections comprises a deflector, each of said conveying attachment sections having a sealing surface thereon;

a first pressure controllable slidable sealing mechanism mounted on said first pneumatic conveying tube, said slidable sealing mechanism is pneumatically operated, said slidable sealing mechanism comprising an annular housing which coacts with said first pneumatic conveying tube to define a pair of annular plenum chambers, said slidable sealing mechanism having a first sealing position and a second release position, a sealing member located around said pneumatic conveying tube, said sealing member operable for being held in pressure contact between a sealing surface on said sealing member and said first slidable sealing mechanism by said first slidable sealing mechanism to thereby form an air tight seal between said sealing surface on said sealing member and said first pneumatic conveying tube; means for guiding and aligning said conveying attachment sections to said first pneumatic conveying tube and including a pair of guide rods having stops thereon, said means for guiding and aligning being pivotally mounted to said member;

a second pressure controllable slidable sealing mechanism oppositely disposed from said first pressure controllable slidable sealing mechanism.

3,907,375
HYDRAULICALLY ACTUATED ADAPTIVE BRAKING SYSTEM USING A SINGLE FLUID

Richard L. Lewis; Jerome T. Ewald, and Martin A. Shields, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Division of Ser. No. 179,919, Sept. 13, 1971, Pat. No. 3,761,140. This application July 12, 1973, Ser. No. 378,756
Int. Cl.² B60T *8/02, 13/14*
U.S. Cl. 303—6 R **8 Claims**

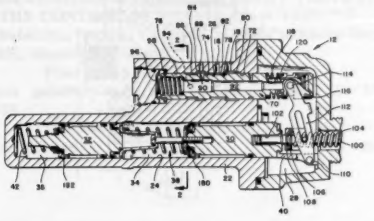
1. In a hydraulic boost device for a vehicle having front and rear wheel brakes:

a housing defining a bore therewithin;

first and second pistons slidable in said bore and defining a first compartment between the end of one of said pistons and the end of the bore, a second compartment between said pistons, and a pressure chamber between the opposite end of said bore and the other piston;

one of said compartments being communicated to at least one of the vehicle's brakes, the other compartment being communicated to the remainder of the brakes of the vehicle, said first and second compartments being communicated to a fluid reservoir; and

operator-actuated valve means slidably mounted within said housing and slidable from a first position venting said pressure chamber to said reservoir to a second position



communicating said pressure chamber to a pressure source, whereby fluid pressure in said pressure chamber shifts said pistons to develop braking pressure in said compartments;

said valve means having an inlet port and first, second and third outlet ports, said first outlet port being communicated to a fluid reservoir;

said valve means in said first position communicating said inlet port to the second outlet port and said pressure chamber and said third outlet port to said first outlet port, said valve means when disposed in said second position restricting flow of fluid between said inlet port and said second outlet port, communicating said inlet port with said pressure chamber and with said third outlet port, and terminating communication to said first outlet port.

3,907,376

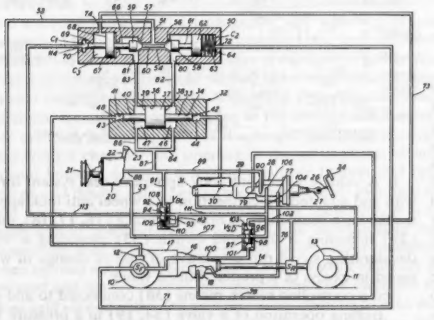
DYNAMIC SKID CONTROL WITH THE TORQUE EQUILIBRIUM CONCEPT

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 8, 1973, Ser. No. 330,868

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 BB **7 Claims**



1. In a vehicular skid control system,

a first sensor and a second sensor to sense the rotational speed of the driven and the undriven wheels of the vehicle,

a speed departure valve operatively connected to said sensors and having a first valve element movable in response to differences in the rotational speed of the driven and undriven wheels,

and a brake lockout valve controlling a second valve element normally positioned in an equilibrium position, but movable upon movement of the speed departure valve element in response to overspeeding of the driven wheels to apply a braking force to brake motor means of said driven wheels,

whereupon the speed of the driven wheels is controlled as a function of optimum road tire interface torque.

3,907,377

ANTILOCKING SYSTEM

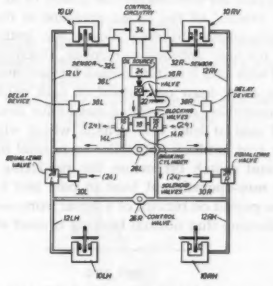
Friedrich Mayer, Haunstetten, Germany, assignor to Allgemeine Industrie Commerz, Walter Von Weizenbeck, Munich, Germany

Filed July 10, 1973, Ser. No. 377,961

Claims priority, application Germany, July 11, 1972, 2233939

Int. Cl. B60t *8/00*

U.S. Cl. 303—21 F **3 Claims**



1. An antilocking system for motor vehicles with a first and second sensor, which are coupled with the right and left-hand front wheel of the motor vehicle respectively and which supply a signal which corresponds to the speed of rotation of the respective wheel, and with a braking force control device, which reduces the braking force acting on a given front wheel when the relevant sensor provides a signal which indicates that the given front wheel is inclined to lock, wherein the braking force control device comprises an arrangement in the form of a pair of hydraulic circuits connected to respective ones of said sensors and a corresponding one of the rear wheels of the motor vehicle and means for generating a braking force, said hydraulic circuits being arranged independently of one another so that on the occurrence of a signal, which indicates that a given front wheel is inclined to lock, the braking force acting on the given front wheel is reduced and also the braking force acting only on the rear wheel located on the same side of the motor vehicle as the given front wheel.

3,907,378
METHOD AND DEVICE FOR MONITORING THE ACTION OF AN ANTILOCK CONTROLLER

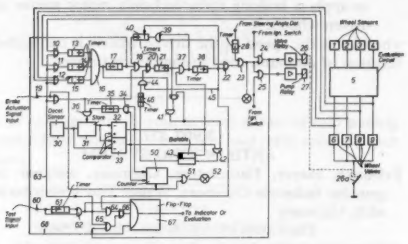
Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Nov. 27, 1973, Ser. No. 419,292

Claims priority, application Germany, Nov. 29, 1972, 2258317; Mar. 20, 1973, 2313763

Int. Cl.[2] B60T *8/00*

U.S. Cl. 303—21 AF **24 Claims**



1. A method for monitoring the action of an antilock controller for control of the brake pressure at the wheels of a vehicle comprising initiating a check operation for said antilock controller, with at least one vehicle wheel braking system disconnected from said controller determining with the aid of said at least one vehicle wheel whether controlled braking or uncontrolled braking is most efficient, and rendering said antilock controller non-operative at least in part and for a predetermined time period if normal braking is found to be most efficient.

22. A device for montioring the action of an antilock controller for control of the brake pressure at the wheels of a vehicle comprising initiating means for initiating a check operation for said antilock controller, disconnection means associated with said initiating means for disconnecting a braking system of at least one wheel of said vehicle from said antilock controller, determining means for determining with the aid of said at least one vehicle wheel whether braking control by said antilock controller or normal braking is most efficient, and switch off means for rendering said antilock controller non-operative at least in part and for a predetermined time period on receipt of a signal from said determining means indicating that normal braking is most efficient.

3,907,379
CONTROL VALVE FOR ANTI-SKID AIR BRAKING SYSTEM

Thomas Gordon Lawson, Birmingham, England, assignor to Girling Limited, Birmingham, England

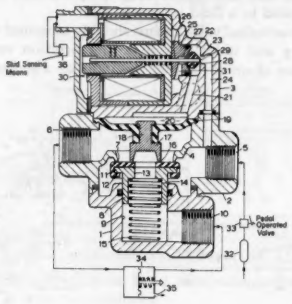
Filed Feb. 12, 1974, Ser. No. 441,875

Claims priority, application United Kingdom, Feb. 13, 1973, 6958/73

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 F **8 Claims**

1. In an air braking system comprising a brake for a wheel of a vehicle, an actuator including a high pressure chamber and a low pressure chamber on opposite sides of a movable wall for applying said brake, a supply of air under pressure, a pedal-operated valve controlling the flow of air from said supply to said high pressure chamber of said actuator, skid sensing means for supplying a signal when the deceleration of said braked wheel exceeds a predetermined value, and skid control means for reducing the differential pressure across said movable wall in response to said signal; a control valve assembly comprising a housing having an inlet connected to said air supply, a first outlet connected to said high pressure chamber, and a second outlet connected to said low pressure chamber, a first valve seat located in said housing between said inlet and said first outlet, a first valve controlling communication through said first valve seat, a spring acting on said first valve so that said first valve is normally closed, a second valve seat located in said housing between said first and second outlets, a second valve controlling communication through said second valve seat, a pressure responsive member controlling said valves, said pressure responsive member having first and second opposed areas and arranged to open said



first valve and close said second valve in response to increased fluid pressure acting on said first area, said first area being acted upon by fluid pressure under the control of said skid control means which is arranged to reduce said pressure acting on said first area in the event of a skid signal to close said first valve and open said second valve, and said second area of said pressure responsive member being exposed to pressure in said first outlet to oppose re-opening of said first valve on cessation of said skid signal.

3,907,380
VEHICLE WHEEL ANTI-LOCK APPARATUS TEST SYSTEM

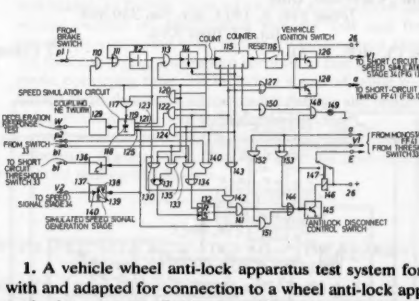
Helmut Fleischer, Schwieberdingen; Helmut Domann, Leonberg; Wolfgang Maisch, Schwieberdingen, and Eberhard Schnaibel, Hemmingen, all of Germany, assignors to Robert Bosch G.m.b.H, Gerlingen-Schillerhohe, Germany

Filed Apr. 8, 1974, Ser. No. 458,821

Claims priority, application Germany, May 9, 1973, 2323358

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—21 AF **24 Claims**



1. A vehicle wheel anti-lock apparatus test system for use with and adapted for connection to a wheel anti-lock apparatus having a pressure fluid operated brake (**16, 17, 18**), means (**29**) including a threshold switch (**33**) providing a wheel deceleration signal representative of rate of change of wheel speed in excess of a predetermined value;

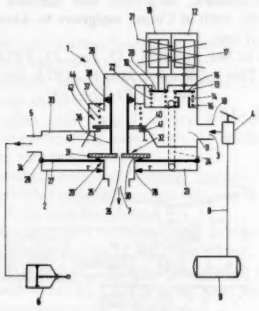
and a controlled switch means (**38**) connected to and controlling operation of a valve (**14, 19**) in a pressure fluid circuit of the brake, to control brake fluid pressure in the brake, said test system comprising

a programmed counter (115);
two monostable flip-flops (FF) (112, 114) controlling stepping of the counter (115);
a capacitor (118);
a speed simulation circuit (119) and a logic circuit including logic gates (117, 120, 122, 124) controlling charging and discharging of the capacitor (118) through said speed simulation circuit (119), in steps, under command and control of the counter (115) to thereby generate a sequence of signals simulating a sequence of vehicle speeds and changes in vehicle speeds for testing the operation of said anti-lock apparatus has been added after "speeds".

3,907,381
PRESSURE-MEDIUM OPERATED RELAY VALVE FOR THE CONTROL OF BRAKES ON A VEHICLE

Adolf Bablitzka, Dachau, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Jan. 6, 1975, Ser. No. 538,932
Claims priority, application Germany, Jan. 25, 1974, 2403675
Int. Cl.² B60T *15/02, 8/02*
U.S. Cl. 303—40 **5 Claims**

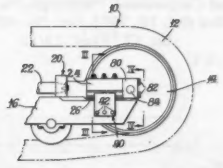


1. A pressure-medium operated relay valve for the electropneumatic control of brakes of a vehicle comprising a valve housing having a diaphragm piston therein defining on one side thereof a control chamber and on the other side thereof a valve chamber connected to a brake cylinder, means in said housing defining a first chamber therein connected to a source of pressure-medium and communicating with said control chamber, a double valve having a first valve member engageable with said other side of said diaphragm piston to define an outlet valve between said valve chamber and the atmosphere and a second valve member engageable with a portion of said housing to define an inlet valve between said first chamber and said valve chamber, said double valve having a hollow rod interconnecting said first and second valve members, a nozzle in said double valve member hollow rod reducing the cross-sectional area therein and opening to the atmosphere, a cylinder centrally mounted on said diaphragm piston to traverse said control chamber and opening to the atmosphere, means in said housing defining a second chamber therein and one end of said double valve hollow rod being slidably mounted in said second chamber and communicating therewith, a normally closed solenoid valve means within said housing for connecting said second chamber and said control chamber when opened such that the pressure in the control chamber is lowered and the pressure in said second chamber increases to close said second valve and said first valve opening to vent the valve chamber as the pressure in the control chamber decreases.

3,907,382
MOUNTING FOR IDLER SPROCKET

Orville E. Kessinger, Jr., Peoria, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Aug. 2, 1974, Ser. No. 494,299
Int. Cl.² B62D *55/10*
U.S. Cl. 305—10 **5 Claims**

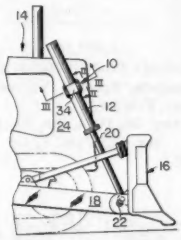


1. A mounting for an idler sprocket on a track roller frame for crawler-type tractors, comprising: a bifurcated track roller frame; a yoke having spaced apart legs mounted for movement on said frame; an idler sprocket disposed between said legs and in the bifurcated portion of said frame; means rotatably mounting said idler sprocket on the ends of said legs; said legs on the surfaces thereof laterally remote from said sprocket, each including a generally horizontally extending recess having at least one bearing surface; and a pair of clamps, one for each recess, removably secured to opposite sides of said frame laterally remote from said sprocket, each said clamp including a horizontally elongated finger directed laterally inwardly towards said sprocket and being provided with a bearing surface disposed in a corresponding one of said recesses with the bearing surface of each finger in sliding engagement with the bearing surface of the corresponding recess.

3,907,383
SEALED TRUNNION BEARING ASSEMBLY

Robert L. Shelby, Chillicothe, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Oct. 17, 1974, Ser. No. 515,703
Int. Cl.² F16C *11/02*
U.S. Cl. 308—3.5 **9 Claims**



1. A sealed assembly for pivotably mounting a movable element relative to a base structure while permitting extended retention of lubricant therein, comprising
a U-shaped clevis secured to the base structure,
a trunnion bracket secured to the movable element and including support shafts extending in opposite directions, a pair of bearing blocks separately secured to the U-shaped clevis and each forming an annular lubricant cavity which is closed at one end and open at the other end for respectively receiving the support shafts, the cavity including an annular bearing surface,
a lubricant fitting in communication with the annular cavity of each bearing block for introducing lubricant therein into, and

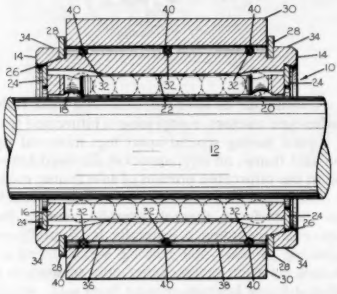
an annular seal arranged adjacent the open end of the annular cavity to close the cavity around the support shaft, thereby maintaining lubricant within the cavity and preventing the entry of foreign matter.

3,907,384

ANTI-FRICTION BALL BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1973, Ser. No. 405,034
Int. Cl.² F16C *29/12*
U.S. Cl. 308—6 C **7 Claims**



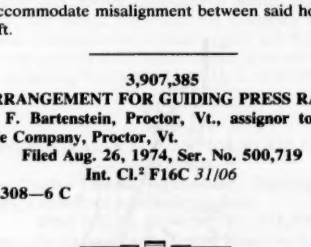
1. An anti-friction ball bearing assembly, adapted for mounting within a housing comprising an outer sleeve and an inner sleeve concentrically fitting within said outer sleeve, said inner sleeve having a central opening for the passage of a shaft therethrough, said inner sleeve having a number of tracks defining paths for the circulation of balls between said sleeves and said shaft during movement between said shaft and said bearing assembly, said balls, during a portion of their circulation path, contacting said shaft and the inner surface of said outer sleeve at a plurality of raceway surfaces provided thereon, said outer sleeve having on its outer surface at least one annular groove, at least one **0** ring disposed in said annular groove and in contact with the inner surface of said housing to accommodate misalignment between said housing and said shaft.

3,907,385

ARRANGEMENT FOR GUIDING PRESS RAMS

Michael F. Bartenstein, Proctor, Vt., assignor to Vermont Marble Company, Proctor, Vt.

Filed Aug. 26, 1974, Ser. No. 500,719
Int. Cl.² F16C *31/06*
U.S. Cl. 308—6 C **8 Claims**



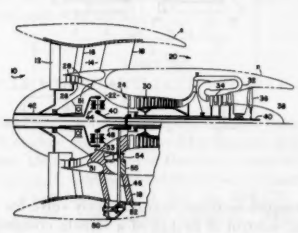
1. In a machine, a bed for reciprocably carrying a moveable machine element, said bed including a generally horizontal supporting surface, and a pair of spaced upright frame members disposed on opposite sides of said supporting surface; at least one supporting rail; means mounting said supporting rail on said supporting surface to extend longitudinally thereof; a pair of guiding rails; means mounting said guiding rails on said upright frame members in generally confronting relationship, the axes of said supporting and said guiding rails all being parallel to each other; a moveable machine element received between said supporting rail and said guiding rails; supporting bearing means carried by said machine element and resting on said supporting rail, said supporting bearing means being in contact with the upper surface of said supporting rail and lying in a vertical plane containing the axis of said supporting rail; a pair of spaced vertical guide bearing means carried on the upper portion of said moveable element, said vertical guide bearing means each being in contact with the underside of one of said guiding rails and lying in a vertical plane also containing the axis of its associated guiding rail; and a pair of horizontal guide bearing means, mounted on the upper, opposite end portions of said moveable element, said horizontal guide bearing means each being in contact with the inner side of one of said confronting guiding rails and lying in a horizontal plane containing the axis of its associated guiding rail.

3,907,386

BEARING ASSEMBLY SYSTEMS

Joseph R. Kasmarik, Stratford, and Ambros S. Hoffmann, West Haven, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Division of Ser. No. 325,137, Jan. 22, 1973, Pat. No. 3,792,586. This application Jan. 11, 1974, Ser. No. 432,714
Int. Cl.² F16C *13/00*
U.S. Cl. 308—15 **3 Claims**



1. A housing comprising
two opposed portions separated by a gap, said portions having shaft receiving openings,
said opposed portions respectively having opposed parallel surfaces surrounding said openings and defining opposite sides of said gap,
a shaft extending through the opening of said opposed portions and spanning said gap, and
a bearing assembly disposed in said gap and comprising a pair of flanges surrounding said shaft and respectively juxtaposed relative to said opposed surfaces for sealing relation therewith,
a compressed spring bellows extending between said flanges and urging them in opposite directions,
a bearing mounted on one of said flanges and journaling said shaft,
means interdigitating axially between one of said flanges and said housing for accurately locating said bearing relative to said housing and said shaft, and
means connected between said flanges for reducing the overall height of said bearing assembly to permit lateral removal of the bearing assembly from said gap when said shaft is withdrawn.

3,907,387
ANTI-FRICTION BEARING

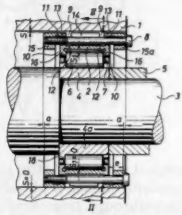
Rudolf Spieth, (2) Kennenburger Str. 42, 73 Esslingen (Neckar), Kennenburg, Germany

Filed Feb. 22, 1974, Ser. No. 445,307

Claims priority, application Germany, Mar. 2, 1973, 2310511

Int. Cl.² F16C *33/30*

U.S. Cl. 308—236 **7 Claims**



1. An antifriction bearing having a raceway and a plurality of rolling bodies, the raceway comprising

a central portion forming a track having one surface in contact with the bodies;

means including said central portion for defining a first annular recess opening away from the bodies;

a reinforcing ring in said recess;

means connected with said central portion for defining second and third annular recesses opening in the opposite direction from said first recess,

said second and third recesses being axially spaced from and on opposite sides of said first recess,

said second and third recesses being axially spaced apart from each other by a distance at least as great as the axial dimension of the roll bodies;

means for axially clamping said raceway at a location radially adjacent said first, second and third recesses; and

reinforcing ring means surrounding said central portion for inhibiting distortion of said track when said raceway is clamped by said means for clamping.

3,907,388
METHOD FOR BLENDING MULTIPLE COMPONENT STREAMS USING LOSS-IN-WEIGHT BOILING POINT ANALYSIS

Benjiman D. Stanton, and Alvin D. Goolsby, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 293,627, Sept. 29, 1972, abandoned, which is a division of Ser. No. 63,534, Aug. 13, 1970. This application Oct. 30, 1974, Ser. No. 519,373

Int. Cl.² B01D *3/42*

U.S. Cl. 208—354 **4 Claims**

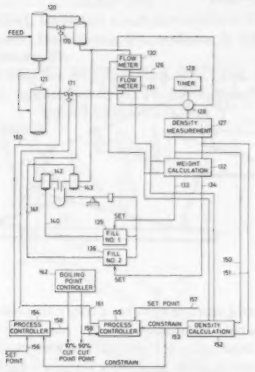
1. A method for blending at least two liquid hydrocarbon components to form a blended liquid having temperature cut-points within preselected ranges, said method comprising: placing measured weight of each of said liquid components in a sample tube to form a sample of said blended liquid;

heating the sample to vaporize it while removing the vapor from the sample;

continuously measuring the temperature of the vapor of the sample;

continuously weighing the sample;

determining the measured temperature of the vapor after a predetermined weight the sample has been vaporized corresponding to one of the preselected cut-points; and utilizing the so determined measured temperature to control the amount of one liquid supplied to the blend to control said one pre-selected cut-point.



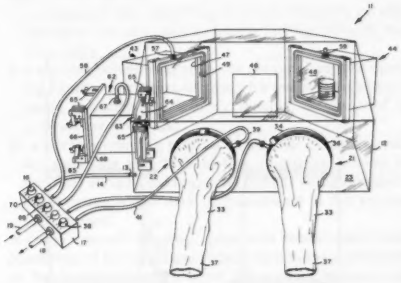
3,907,389
GLOVE BOX CHAMBER

Marion E. Cox, and Mary E. Cox, both of 10337 Glencoe, Cupertino, Calif.

Filed Dec. 12, 1973, Ser. No. 426,672

Int. Cl.² A61G *11/00*

U.S. Cl. 312—1 **16 Claims**

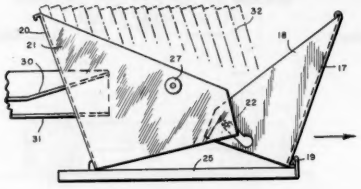


1. A chamber for maintaining an object in an isolated environment comprising an enclosure for separating said object from an atmosphere ambient to said chamber; and at least one access port enabling admission of the hand of an operator into said enclosure for manipulation of an object therein, said access port including a door sealing an aperture in the wall of said enclosure through which said hand is extendable into the interior of said enclosure, and a sleeve sealed to said enclosure in communication with said aperture, a free end portion of said sleeve extending to the exterior of said enclosure and providing a pre-access chamber for separating the hand of the operator from the ambient atmosphere prior to the opening of said door for access of said hand into said enclosure.

3,907,390
VISIBLE RECORD STORAGE SYSTEM

Frederic J. Moriarty, Worcester, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Filed July 3, 1974, Ser. No. 485,353
Int. Cl.[2] A47B 88/00
U.S. Cl. 312—303 15 Claims

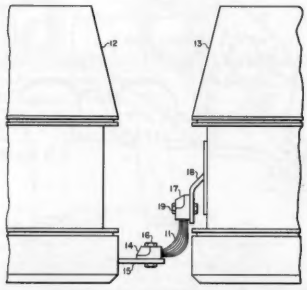


1. In a record storage system, a tray comprising a pan, front and back panels supported by the pan and being coupled together at their sides for pivotal motion, means for limiting pivoting of said panels, including flanges which overlap each other and wherein bearing means is supported by the flanges of one of said panels and is supported in slots provided in flanges of the other of said panels.

3,907,391
FLEXIBLE INTERCELL CONNECTOR FOR ELECTROLYTIC CELLS

Alvin T. Emery, Youngstown; Lee G. Evans, Tonawanda, and John E. Currey, Lewiston, all of N.Y., assignors to Hooker Chemicals and Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 1, 1973, Ser. No. 384,646
Int. Cl.[2] H01R 7/08, 11/00
U.S. Cl. 339—29 R 12 Claims

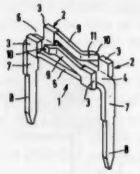


1. A flexible intercell connector, suitable for electrically connecting electrolytic cells, comprising a plurality of thin conductive metal sheets of a predetermined length joined and laminated at their opposite ends by encapsulation and fusion to form a conductive metal casting around each end, said metal sheets comprising a stack between said castings, and having a portion of their major surfaces in a spaced relationship to one another, each sheet in said stack being progressively greater in length.

3,907,392
MULTI-TERMINAL CONNECTOR STRIP

Herbert Haag, Grossheppach; Erich Kreutter, Winterbach, and Wilfried Muller, Fellbach, all of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 24, 1974, Ser. No. 473,280
Claims priority, application Germany, June 5, 1973, 2328620
Int. Cl.[2] H01R 27/00, 11/22
U.S. Cl. 339—32 M 15 Claims

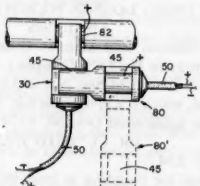


1. A multi-terminal connector strip comprising:
an elongate insulator having a plurality of contact cavities extending therethrough transversely with respect to the longitudinal axis of the insulator, said insulator having a mounting plane adapted to engage a mounting board;
a socket contact mounted in each of said cavities and provided with a leg extending through said mounting plane for securement within a hole in said board; and
each said socket contact having open end sections adjacent to the opposite ends of its corresponding contact cavity defining entrance holes for optionally receiving mating pin contacts inserted into either end of said cavity, each said end section of each socket contact having a U-shaped cross-section defining a base and a pair of parallel legs, a generally flat, longitudinal bridge member joining the bases of each said socket contact and being generally coplanar therewith, each said socket contact having a pair of spring members each having a fixed end connected to a leg of an opposite one of said end sections on opposite sides of said bridge member and a free movable end, said spring members extending in opposite directions toward each other.

3,907,393
HYBRID TAKEOUT CLIP

Philip James Ludwig, Houston, Tex., assignor to Walker-Hall-Sears, Inc., Houston, Tex.

Filed June 28, 1974, Ser. No. 484,060
Int. Cl.[2] H01R 13/28
U.S. Cl. 339—47 R 4 Claims

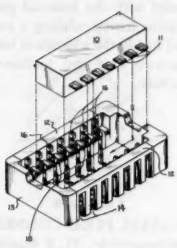


1. A hybrid takeout clip comprising:
an insulating sleeve having a pair of opposed transverse wall slots;
a pair of opposed takeout plates covering said slots; and
a pair of opposed resilient prongs electrically connected to said takeout plates and projecting outwardly of said sleeve, said opposed transverse wall slots exposing said takeout plates for connection to the prongs of a second like takeout clip.

3,907,394
CIRCUIT SOCKET AND REMOVABLE PACKAGE

Ronald B. Barnes, Camp Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 2, 1973, Ser. No. 375,375
Int. Cl.[2] H01R *13/62;* **H05K** *1/04*
U.S. Cl. 339—65 **11 Claims**

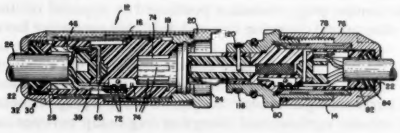


1. A socket for removably receiving a circuit element having a rectangular body and a plurality of leads disposed on opposite sides of said body, said socket comprising a pair of spaced opposing insulating members, each opposing member having a plurality of spaced contact terminals mounted therein, each member having a top surface, a face including a plurality of spaced coplanar guide surfaces recessed from said top surface, and a bottom surface substantially parallel with said top surface and said guide surfaces, a respective guide surface disposed to one side of each contact terminal for receiving each lead when said circuit element is inserted in a first direction and guiding said leads when said circuit element is slid in a second direction to engage said leads in electrical connection with said contact terminals, each of said contact terminals having at least one contact surface for engaging a circuit element lead and a cam surface between said contact surface and its respective guide surface, said cam surface inclined relative to said respective guide surface for facilitating smooth sliding of said leads in said second direction.

3,907,395
ELECTRICAL PLUG AND JACK ASSEMBLY

William H. Flanagan, Stamford, Conn., assignor to Nexus, Incorporated, Stamford, Conn.

Filed July 26, 1974, Ser. No. 492,023
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—99 R **4 Claims**



1. An electrical connector for use with multi-circuits comprising:

a. Contact members positioned on an insulated carrier,

b. said insulated carrier having a series of longitudinally extending circumferentially spaced grooves formed thereon,

c. barbed extensions of the contact members extending through said insulated carrier into said grooves,

d. a wiring harness carrying a series of resilient arms with electrical leads retained, by said arms,

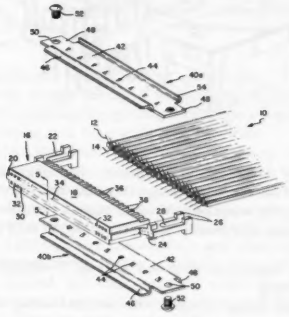
e. said wiring harness adapted for axial engagement with said carrier with arms juxtaposed to the circumferential grooves,

f. a compression member concentrically positioned around a portion of said arms, whereby longitudinal movement of said compression member will compress the leads into piercing engagement with the barbed extensions to effectuate electrical continuity with said contact members.

3,907,396
COAXIAL RIBBON CABLE CONNECTOR

John Henry Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 391,727, Aug. 27, 1973, Pat. No. 3,864,011. This application Sept. 18, 1974, Ser. No. 507,170
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 R **1 Claim**



1. A connector housing for housing contact members of the type having an offsetting opposing cantilever contact section and a dual, in-line cantilever, torsion bar terminal section, which comprises:

a. a housing body of insulating material;

b. two rows of a plurality of cavities extending from one end to another end of said body and opening out at each end, said cavities having

i. an entrance for admitting contact elements of other electrical circuits, said entrance having inwardly beveled walls,

ii. a portion behind said entrance for receiving the opposing cantilever contact section with one side wall thereof being undercut to slidingly receive the base of the contact member, and

iii. a contact opening portion at the rear of such cavities for receiving the dual, in-line cantilever torsion bar terminal section, said opening further being adapted to admit wires which may be terminated in the terminal section; and

c. a cable contact opening cover and strain relief clamp consisting of two identical halves each being positionable on the housing body to cover the contact openings said halves having inwardly directed lances for piercingly engaging the insulation on wires which may be terminated to the contact members which may be positioned in said cavities.

3,907,397
HIGH DENSITY CONNECTOR PLUG ASSEMBLY

Neil F. Damon, Cumberland, R.I., assignor to Augat, Inc., Attleboro,, Mass.

Filed Sept. 30, 1974, Ser. No. 510,230
Int. Cl.[2] H01R *13/58, 33/04*
U.S. Cl. 339—107 **9 Claims**

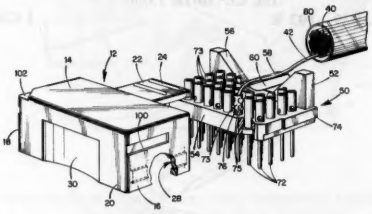
1. A high density connector plug assembly for connecting a multi-wire cable bundle to a panel board comprising:

a generally rectangular housing for enclosing the end of said multi-wire cable bundle, said housing comprising:

a generally rectangular hood having two sides, a top and a forward end, the rearward end and bottom of said hood being open;

a generally L-shaped base having a bottom plate and an end, said end fitting the open rearward end of said hood and said bottom plate fitting the open bottom of said hood, said base having a generally V-shaped opening in said end and an orthogonal matrix of countersunk bores through said bottom plate; and

means for coupling said base and said hood together;



a plurality of electrical connector pins disposed in said bores of said base and projecting outwardly from one side thereof, the wires of said cable bundle being individually connected electrically and physically to said connector pins;

clamping apparatus disposed at said V-shaped opening comprising:

an upper flange integral with and extending rearwardly from said hood top; and

a lower flange integral with and extending rearwardly from the base of said V-shaped opening in said rearward end of said base, said lower flange cooperatively with said upper flange abutting the top and bottom of said cable bundle.

3,907,398

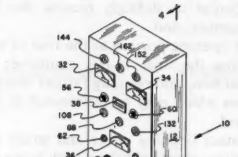
LOAD CIRCUIT AND METHOD

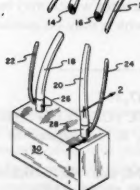
James O. Hebert, Jr., Box 1193, and Donald F. Fitzgerald, Box 991, both of Mississippi State, Miss. 39762

Division of Ser. No. 398,489, Sept. 18, 1973, Pat. No. 3,848,181. This application Sept. 4, 1974, Ser. No. 502,935

Int. Cl.[2] H01R *13/00*

U.S. Cl. 339—112 L **3 Claims**





1. An improved battery terminal connector comprising:

a. an elongated structure;

b. a battery terminal lead, fixedly attached to one end of the elongated structure;

c. recess means, for receiving the battery terminal formed in the other end of the elongated structure;

d. an internal passageway, initiating on one side of the structure and terminating at the end of the structure having the terminal lead fixedly attached thereto;

e. an electrical insulator, surrounding the terminal lead and fixedly attached to the elongated structure; and

f. means, associated with the internal passageway and the electrical insulator, for circulating a coolant through the passageway and inside the electrical insulator to cool the elongated structure and the terminal lead contained within the structure.

3,907,399

HF COAXIAL PLUG CONNECTOR

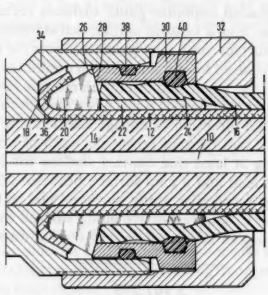
Georg Spinner, Erzgiessereistr. 33, 8 Munich 2, Germany

Filed Dec. 12, 1973, Ser. No. 423,908

Claims priority, application Germany, Dec. 12, 1972, 2260734

Int. Cl.[2] H01R *17/18*

U.S. Cl. 339—177 R **8 Claims**



1. An HF coaxial conductor clamping assembly comprising:

a coaxial cable with an internal conductor, an external conductor surrounding said internal conductor and a dielectric layer therebetween;

a clamping ring extending annularly around said external conductor and having an end with an end face over which said external conductor is crimped;

an annular plug connector positioned in opposed relationship to said clamping ring end; said plug connector having an end contact annular surface positioned such that said clamping ring end face clamps said external conductor against said annular surface for making electric contact; a nut having a shoulder facing toward said plug connector annular surface; said clamping ring being between said nut shoulder and said end contact annular surface and said shoulder being spaced from said clamping ring; means on said nut for screwing it onto said plug connector and for tightening said nut toward said plug connector end contact annular surface;

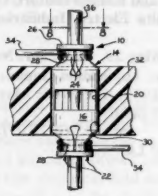
a pressure transmitting sleeve extending annularly around said external conductor and interposed between said clamping ring and said nut shoulder, such that tightening of said nut presses said sleeve against said clamping ring to clamp said external conductor;

said sleeve and said clamping ring having cooperating, engaging and matingly tapered annular surfaces that are angled to force said clamping ring radially inwardly against said external conductor.

3,907,400
CONTACT POST

Richard K. Dennis, Etters, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 21, 1973, Ser. No. 417,928
Int. Cl.² H01R 9/16
U.S. Cl. 339—221 R 12 Claims

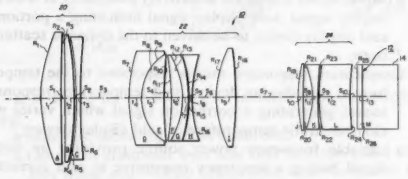


1. A contact post adapted to be mounted in a hole in a support comprising an elongate post, a pair of arcuate springs joined to opposite sides of the post and each extending substantially 180° around the post to define a generally cylindrical spring portion adapted to be fitted in the hole in the support and to engage substantially the entire interior circumference of the hole, and wire contact means extending from one side of one spring and located adjacent the post within the outer circumference of the cylindrical spring portion.

3,907,401
HIGH PERFORMANCE OPTICAL OBJECTIVE

Wai-Min Liu, Arleta, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed July 1, 1974, Ser. No. 484,725
Int. Cl.² G02B 9/64, 13/14
U.S. Cl. 350—2 6 Claims

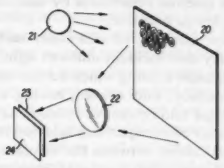


1. An optical objective comprising three fixed groups of lens elements, the front fixed lens group comprising a positive lens element which is spaced in front of a positive meniscus lens element which is spaced in front of a negative lens element concave to the front, the second fixed lens group comprising a doublet lens element comprising a negative meniscus lens element the rear surface of which is cemented to a first positive lens element convex to the front spaced in front of a second doublet element comprising a positive meniscus lens the rear surface of which is cemented to the front surface of a negative meniscus lens element concave to the front which is spaced in front of a biconcave lens element which is spaced in front of a second positive lens element convex to the front, and the third fixed lens group comprising a positive meniscus element convex to the front spaced in front of a negative lens element concave to the front spaced in front of a third positive meniscus lens element convex to the front.

3,907,402
HOLOGRAPHIC READOUT SYSTEM

Albert A. Friesem, Ann Arbor, Mich., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Division of Ser. No. 239,594, Mar. 30, 1972, Pat. No. 3,823,412. This application Apr. 18, 1974, Ser. No. 461,999
Int. Cl.² G03H 1/22, 1/16; G03B 23/00; F21K 2/00
U.S. Cl. 350—3.5 9 Claims



1. A multicolor display system, comprising

a viewing screen having a multiplicity of closely spaced photoluminescent segments thereon in a regular array of alternating red, blue and green segments,

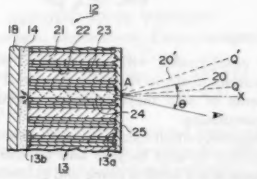
a hologram positioned relative to said screen to project an image thereon of a multicolor subject when the hologram is illuminated by a readout beam of coherent light, wherein said hologram has been produced by recording the interaction of a reference beam and an object beam passed through an encoded black and white transparency, said transparency having a regular array of alternating first, second, and third sections which is geometrically similar to said regular array of alternating red, blue, and green segments, with all of said first sections, said second sections, and said third sections containing information in terms of transparency about only red, only blue, and only green respectively present in portions of a multicolor subject, and

means for directing a readout beam of coherent light onto said hologram to reconstruct said image on said screen in a multicolor display.

3,907,403
FIBRE-OPTICS FACEPLATE OBSERVABLE WITH HIGH-INTENSITY AMBIENT ILLUMINATION

Haruo Maeda, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 286,263, Sept. 5, 1972, abandoned, which is a continuation of Ser. No. 56,894, July 21, 1970, abandoned. This application June 18, 1974, Ser. No. 480,364
Claims priority, application Japan, July 28, 1969, 44-60684
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 B 3 Claims



1. A fibre optics faceplate having a nearly black surface, for displaying an optical image of high contrast under high-intensity ambient illumination conditions, comprising:

A. a screen formed of a bundle of side-by-side optical fibres, comprising cores having a selected index of refraction, claddings enveloping each of said cores, and absorbing glass layers disposed between said clad cores, said bundle

having an outer surface and an inner surface at the opposed ends of said fibres;

B. as a light-scattering means for ambient light passing through said cores from said outer surface, a fluorescent layer as a coating on said inner surface;

C. a minimizing means for ambient light that is incident upon said dark surface, comprising:

1. a numerical aperture of up to about 0.4 for said bundle that defines a relatively narrowed viewing angle, increases internal reflections by said claddings, and improves image contrast,

2. a coarse finishing of said outer surface that scatters randomly said incident ambient light, and

3. a transparent coating which covers said coarse finished outer surface, said coating having a refractive index lower than said refractive index of said cores and having a range of transparency selected in consideration of the relationship between the wavelength characteristic of the light emitted from said fluorescent layer and the spectral sensitivity of an observer's eyes, whereby interference of said ambient light with said image is minimized and said narrowed viewing angle is widened; and

D. a light absorption means for said randomly scattered ambient light entering said cores through said transparent coating and for said ambient light scattered back into said cores by said fluorescent layer, comprising:

1. an index of refraction for said claddings that is lower than said selected index of refraction, whereby said scattered ambient light in said cores is partially reflected outwardly, and

2. light absorption capability in said absorbing glass layers for absorbing said outwardly reflected ambient light passing through said claddings.

3,907,404

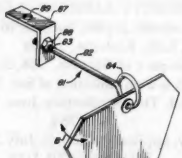
SAFETY REFLECTOR FOR BICYCLE

Bennie L. McEwin, 352 E. Papago Dr., Tempe, Ariz. 85281

Continuation-in-part of Ser. No. 349,441, April 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 247,739, April 26, 1972, abandoned. This application June 21, 1974, Ser. No. 482,507

Int. Cl.[2] G02B *5/12*

U.S. Cl. 350—99 **1 Claim**



1. In combination with a bicycle, a safety signal which moves automatically in response to normal vertical and lateral movements of said bicycle during operation thereof, said signal comprising:

a. elongate eye-bolt means including a shank portion fixedly attached to said bicycle and an eye portion generally disposed in a vertical plane and extending outwardly from said bicycle; and

b. a generally triangular shield member, having at least one light-emitting surface, pivotally suspended from said eye portion of said bolt, said eye portion passing through an aperture formed approximately midway along one edge of said shield member and spaced inwardly therefrom a distance to define limits on the displacement of said shield member with respect to said eye-bolt in response to normal operation of said bicycle, said limits being approximately ± 5° from the vertical in a forward and rearward direction and approximately ± 30° laterally.

3,907,405

LIQUID CRYSTAL DISPLAY SYSTEM

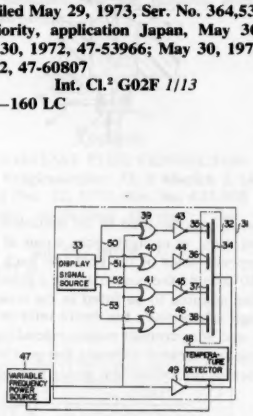
Masakazu Fukai, Nishinomiya; Seiichi Nagata, Sakai; Komei Asai, Hirakata, and Katsuji Hattori, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 29, 1973, Ser. No. 364,535

Claims priority, application Japan, May 30, 1972, 47-53965; May 30, 1972, 47-53966; May 30, 1972, 47-53967; June 16, 1972, 47-60807

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—160 LC **16 Claims**



1. A liquid crystal display system comprising:

a liquid crystal display device including a nematic liquid crystal;

a display signal source for selectively generating at least one display signal, said display signal indicating a portion of said display device to be driven to the dynamic scattering state;

temperature responsive means responsive to the temperature of said display device, said temperature responsive means generating a correction signal which varies with changes in the temperature of said display device;

a variable frequency power source providing an output signal having a frequency responsive to said correction signal whereby said frequency increases with increases in the temperature of said display device; and

means for gating responsive to said at least one display signal for applying said output signal to said device portion whereby said output signal drives said portion to said dynamic scattering state.

3,907,406

LIQUID CRYSTALLINE COMPOUNDS

Lewis B. Leder, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

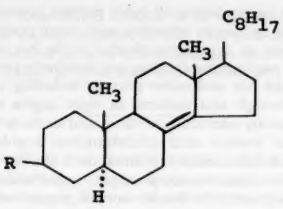
Division of Ser. No. 300,050, Oct. 24, 1972. This application Apr. 26, 1974, Ser. No. 464,406

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—160 LC **8 Claims**

1. An imaging method comprising the steps of

providing a layer of an imaging material comprising a compound having a cholesteric liquid crystalline mesophase which is represented by the formula



wherein R represents a member selected from the group consisting of halogens, aliphatic ester radicals having from three to fifteen carbon atoms and carbonate radicals having up to and including fifteen carbon atoms; and

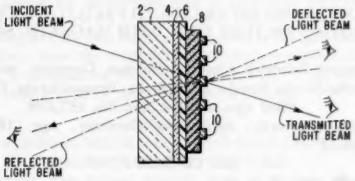
applying an imagewise electrical field across said layer while said imaging material is in the cholesteric liquid crystalline mesophase to cause an imagewise change in the appearance of image portions of said imaging material layer while the background portions of said imaging material layer retain an appearance substantially distinguishable from the image portions of said layer.

3,907,407

ELASTIC LIGHT-SCATTERING MODULATOR DEVICE

David Herman Raphael Vilkomerson, Princeton, and Reuben Saul Mezrich, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,565
Int. Cl. G02f *1/28*
U.S. Cl. 350—161 **8 Claims**



1. A device for modulating an incident light beam comprising:

a substrate including a first electrode,

a film of an elastomer over said first electrode, said elastomer being one whichh compresses when subjected to an electric field up to a certain threshold value, resists further compression and becomes rippled when said field is above said threshold value and returns to its original condition when said field is removed, and

a second highly flexible electrode over said elastomer film such that, when an electric field is applied to said electrodes above said threshold value, said elastomer film ripples, thereby deflecting said incident light beam.

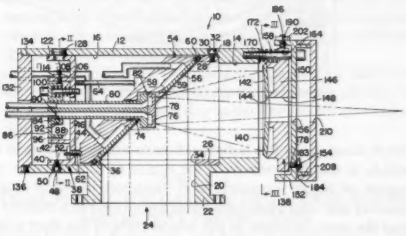
3,907,408

CASSEGRAINIAN MIRROR ARRANGEMENT FOR LASERS

Simon L. Engel, Peoria, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Aug. 20, 1973, Ser. No. 389,691
Int. Cl.² G02B *5/10*
U.S. Cl. 350—294 **1 Claim**

1. A mirror system for controlling a supply laser beam comprising a housing, an opening in said housing, a first mirror disposed at an angle with respect to said opening, said mirror having a flat reflective surface and positioned to reflect the supply laser beam passing through said opening substantially 90° from the direction of travel of the supply laser beam, said first mirror having an opening disposed centrally thereof; a second mirror disposed forwardly of said first mirror and having a concave reflective surface and positioned to reflect the laser beam reflected from the reflective surface of the first mirror and defining an aperture through the reflective surface thereof, means for supporting said second mirror relative to said housing; a third mirror disposed within said first mirror opening and having a convex reflective surface positioned to convergingly reflect the laser beam reflected from the reflective surface of the second mirror outwardly through said aperture, independent means for adjusting each of said mirrors relative to one another to control the laser beam, said independent adjusting means for said first and third mirrors comprising a support ring fixedly disposed in said housing rearwardly of said mirrors, and defining a central opening, spaced adjusting locked screws positioned about said ring and



engaging the back surface of said first mirror, for aadjusting the angle thereof, a second support ring, means supporting said second ring on said first ring concentrically thereof, said second support ring having an opening therein aligned rearwardly of said first mirror support opening, said third mirror having a body portion extending through said aligned openings, means securing said body portion to said second ring, a first set of lockable adjusting screw means positioned in said second ring and engaging said first ring for angularly and axially adjusting said third mirror, and a second set of adjusting screw means secured to said second ring for radially adjusting said third mirror, said independent adjusting means for said second mirror comprising a support for said mirror; adjustable screw means disposed about said third mirror support for connecting the same to said housing; a first set of adjusting screws dispposed on said third mirror support and engaging the rear surface thereof for angularly and axially adjusting said mirror with respect thereto and a second set of adjusting screw means radially disposed with respect to said support and said third mirror for radially adjusting the same.

3,907,409

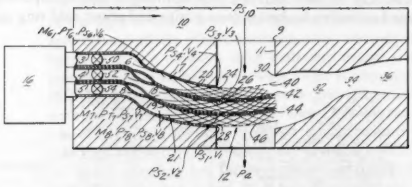
AERODYNAMIC WINDOW

George F. Hausmann, Glastonbury, Conn., assignor to United Aircraft Corporation, Hartford, Conn.

Filed Jan. 28, 1974, Ser. No. 437,114
Int. Cl.² H01S *3/22;* **G02B** *5/00*
U.S. Cl. 350—319 **2 Claims**

1. In combination in a system having a region of low pressure, an opening in said region forming an exit, an outlet chamber connected to said system and extending away therefrom around said opening, and an aerodyamic window assembly permitting passage therethrough to a region of higher pressure, and aerodynamic window assembly comprising a plurality of transverse ducts connected to one side of said outlet chamber and terminating at the wall of said chamber, said plurality of said ducts extending in line along the length of said outlet chamber, said plurality of ducts each containing a Laval nozzle to generate a supersonic gas flow, pump means

for supplying gas flow to said Laval nozzles, said Laval nozzles each expanding the gas passing therethrough to a supersonic velocity, said plurality of ducts being curved downstream of the Laval nozzles in a manner with said ducts each having an increasing radii of curvature in the direction from the region of low pressure to the region of higher pressure to provide a variation in velocity and static pressure along the axis of the outlet chamber by virtue of the formation of expansion waves on the inner convex surface of each duct and compression waves on the outer concave surface of each duct, said variation of static pressure increasing in magnitude in the direction from the region of low pressure to the region of higher pressure, a duct means being formed on the opposite side of said chamber to receive the flow transverse ducts, said transverse, said Laval nozzles having prescribed expansion ratios to provide a variation of Mach number in each duct such that the



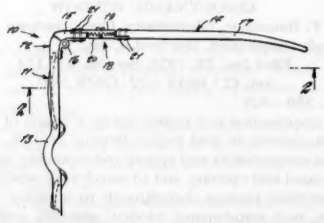
Mach numbers in the individual ducts are decreasing in magnitude in the direction from the region of low pressure to the region of higher pressure, said variation in Mach number, velocity and duct curvature being prescribed in a manner such that the static pressure at the intersection of the duct wall and the outlet chamber nearest the region of low pressure is equal to the pressure therein, the static pressure at the intersection of the furthermost duct wall and the outlet chamber is equal to the pressure in the region of higher pressure, and the static pressures at the intersection of each intermediate wall with said outlet chamber are balanced whereby the static pressure along the streamline of the innermost free boundary is equal to the pressure in the region of low pressure, the static pressure along the streamline of the outermost free boundary is equal to the atmospheric pressure and the static pressure along the streamlines emanating from the intermediate duct boundaries are balanced.

3,907,410

INTEGRAL VERTICAL PLAN ADJUSTING MECHANISM FOR EYE GLASSES

Rex Richmond; Jack Moriarity, and George Spector, all of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Nov. 27, 1973, Ser. No. 419,266
Int. Cl.[2] G02C *5/14, 5/22*
U.S. Cl. 351—119 **2 Claims**



1. An eye glass frame construction comprising a lens frame and a pair of temple bars secured pivotally to the frame at each end whereby the bars pivot inwardly towards the frame and outwardly to assume a position at right angles to said frame, each bar including an outer portion pivotally secured to said bars by means whereby said outer portion can be pivoted about an axis perpendicular to the bar, said means comprising overlapping abutting and relatively pivotable surfaces on said bar and outer portion including a pivot pin mounted through said surfaces at right angles to the bar, further including interacting teeth on said surfaces to maintain the bar and portion at a predetermined angular postion, wherein each said surface is formed on a disc having aligned central bores to receive said pivot pin, one of said bores being threaded to coact with threads on said pin to lock the discs against rotation, including arms on said discs extending in opposite directions for securement to said bar and outer portion, and said interacting teeth include meshed corrugations in a curvate pattern relative to the axis of rotation of said outer portion relative to said bar.

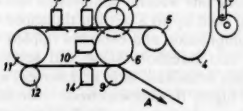
2. An eye glass frame construction comprising a lens frame and a pair of temple bars secured pivotally to the frame at each end whereby the bars pivot inwardly towards the frame and outwardly to assume a position at right angles to said frame, each bar including an outer portion pivotally secured to said bars by means whereby said outer portion can be pivoted about an axis perpendicular to the bar, said means comprising overlapping abutting and relatively pivotable surfaces on said bar and outer portion including a pivot pin mounted through said surfaces at right angles to the bar, further including interacting teeth to maintain the bar and portion at a predetermined angular position, wherein said surfaces and interacting teeth include a disc-like projection having gear teeth and the outer portion includes a worm rotatably mounted about an axis perpendicular to said pivot pin axis, said worm being in operative engagement with said teeth, said outer portion having bifurcated arms parallel to and pivotable relative to the said projection, whereby said pivot pin is mounted through the said projection and arms.

3,907,411

PROCESS AND APPARATUS TO FACILITATE CUTTING MOTION PICTURE FILM WITH MAGNETIC SOUND TRACK

Hermann Friedrich Albrecht, Hotzum, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Apr. 4, 1974, Ser. No. 457,808
Claims priority, application Germany, Apr. 18, 1973, 2319633
Int. Cl. G03b *31/00*
U.S. Cl. 352—5 **3 Claims**



1. Apparatus for alternative use either for projecting, in normal fashion, an amateur motion picture film with magnetic sound track, or for transferring sound from a portion of said sound tack spaced longitudinally from a picture area to which the sound relates to a portion of said sound track located alongside the picture area to which the sound relates in order to facilitate subsequent cutting and editing of the film, said apparatus comprising a picture projection gate, a first sound pick-up head, means defining a first path of travel of film from said gate to and past said first pick-up head in cooperative relation thereto, a second sound pick-up head, an erasing head, a sound recording head, and means defining a second path of travel of film from said gate to and successively past said second pick-up head, said erasing head, and said record-

ing head in cooperative relation to all of them and in non-cooperative spaced relation to said first pick-up head, said first path of travel being in non-cooperative spaced relation to said second pick-up head, said erasing head, and said recording head.

3,907,412
FILM PROJECTOR WITH SOUND

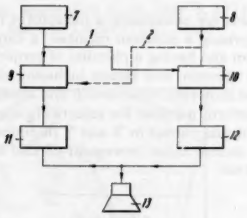
Hans Achim Schaller; Gunter Reinhardt, both of Nuremberg, and Dieter Zenger, Schwabach, all of Germany, assignors to Ernst Plank KG, Nuremberg, Germany

Filed Oct. 29, 1974, Ser. No. 518,608

Claims priority, application Germany, Oct. 30, 1973, 2354286

Int. Cl.² G03B *31/00*

U.S. Cl. 352—11 **12 Claims**



1. In a projector assembly for projecting a visual filmed image and simultaneously reproducing sound recorded on sound track means, the improvement comprising means for simultaneously reproducing at least two separate acoustical information patterns recorded on at least two separate sound tracks, means for amplifying said at least two information patterns, and means for controlling the volume level at which one of said at least two information patterns is reproduced in dependence upon the volume level at which said other of said patterns is reproduced while said patterns are being simultaneously reproduced by said projector apparatus.

3,907,413
STRIP-FEEDING MECHANISM FOR MOTION-PICTURE PROJECTORS AND THE LIKE

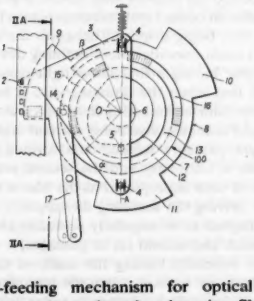
Josef Morell, and Johann Nowak, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Jan. 24, 1973, Ser. No. 326,444

Claims priority, application Austria, Feb. 1, 1972, 797/72; June 2, 1972, 4784/72

Int. Cl. G03b *1/22*

U.S. Cl. 352—79 **10 Claims**



1. A strip-feeding mechanism for optical equipment adapted to scan an intermittently advancing film strip provided with a row of longitudinally equispaced perforations, comprising:

a source intermittent intermittent illumination for said film strip interrupted by periodically recurrent off-periods;

first and second cam means mounted for rotation in synchronized relationship with said source for performing a revolution coinciding with a plurality of said off-periods;

guide means for leading a film strip along a predetermined path;

feed means engageable with a perforation of said film strip but normally disengaged therefrom, said feed means being displaceable by said first cam means in a transport direction substantially parallel to said path and being displaceable by said second cam means in a perforation-engaging direction generally transverse to said path, said first cam means being provided with a plurality of transport formations at peripherally spaced locations for coacting with said feed means during different off-periods in the course of a revolution, said second cam means having at least one engaging formation positioned for coacting with said feed means during any of said different off-periods to enable entrainment of said film strip by any one of said transport formations upon engagement of said feed means with a perforation thereof, said transport formations having configurations corresponding to different transport modes; and

control means operatively coupled with one of said cam means for selectively deactivating same during all but one of said off-periods occurring in the course of one revolution.

3,907,414
OPTICAL PROJECTOR CAPABLE OF RANDOM ACCESS AND REPEAT PROJECTIONS

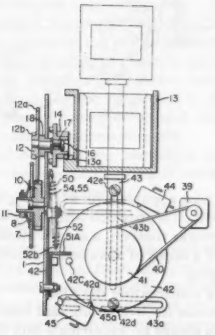
Masanori Uchidoi, Kawasaki, and Tateo Yamada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1973, Ser. No. 413,209

Claims priority, application Japan, Nov. 11, 1972, 47-113174

Int. Cl.² G03B *23/02*

U.S. Cl. 353—25 **10 Claims**



1. A film projection system capable of selecting projection modes comprising:

means for storing a plurality of slide films;

transport means for transporting said slide film storage means to a slide film projecting position where the slide film is set for projection;

first driving means for driving said transport means;

sliding means for selectively sliding the slide film in said storage means between the storing position of said storage means and the slide film projectable position where the projection of the slide film can be performed;

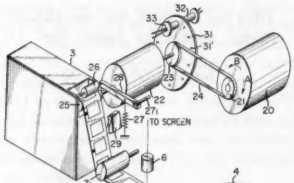
stepping means adapted to couple to said transport means and cooperate with said sliding means for moving said

transport means by one frame of the film by coupling to said transport means before said slide means causes the slide film to slide to said slide film projectable position;
second driving means for driving said sliding means;
sequential projection control means for controlling said second driving means to sequentially project said slide film one frame at a time;
random access projection control means for controlling said first and second driving means to selectively project a desired film of said plurality of slide films;
switching means for selectively switching projection modes, one of which is a sequential projection mode selected by said sequential projection control means, and the other being a random access projection mode selected by said random access projection control means; and
releasing means for releasing said stepping means from being coupled with said transport means when said random access projection control means is selectively actuated by said switching means to control said second driving means.

3,907,415
FILM SEARCHING APPARATUS

Yoshiaki Sone, Tokyo, and Fumio Ueno, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1974, Ser. No. 457,178
Claims priority, application Japan, Apr. 11, 1973, 48-41001; Sept. 20, 1973, 48-106280; Sept. 20, 1973, 48-106281
Int. Cl.² G03B *27/00*
U.S. Cl. 353—26 **11 Claims**

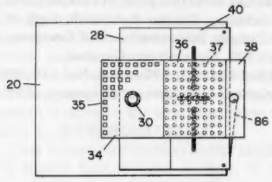


1. A film searching apparatus for searching desired information from a film which is provided with many kinds of information and search marks thereon, a search mark being provided for at least one of a series of associated information groups on the film comprising:
feed means for transporting the film;
light source means for irradiating said search mark;
mark detection means for receiving a flux of light projected on the search mark to generate a detection signal;
pulse generating means operated in cooperation with said feed means for generating a pulse signal in response to the feed of film;
gate means for receiving said detection signal and said pulse signal and selectively passing either one of said signals;
counter means for counting signals passed through said gate means and generating a control signal upon a count of a predetermined value;
gate control means responsive to said control signal for controlling the selection of the signal to be passed through said gate means; and
transport control means for controlling the film feed of said feed means in response to said control signal.

3,907,416
MICROFORM POSITIONING APPARATUS

Johann E. Frank, Yellow Springs, and Klaus W. Otten, Xenia, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed July 18, 1974, Ser. No. 489,875
Int. Cl.² G03B *23/08*
U.S. Cl. 353—27 **20 Claims**

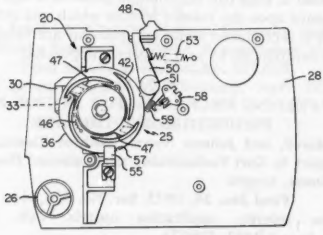


1. Apparatus for positioning a microform in a microform reader, comprising a platform member, a carrier secured to the microform and having a plurality of projections in matrix arrangement thereon, and means including elongated members disposed in normal relationship and operably associated with said platform member for selectively engaging with the projections of said carrier in X and Y direction and retaining said carrier thereat upon movement of said microform to a desired position.

3,907,417
CONTROLLED PROJECTION READER

Joerg Fischer, Madison, Ala., assignor to Avco Corporation, Huntsville, Ala.

Filed Feb. 10, 1975, Ser. No. 548,195
Int. Cl.² G03B *21/44*; G09B *17/04*; G03B *1/48*
U.S. Cl. 353—46 **7 Claims**



1. In a projection system of the type in which a film is held stationary or moved step by step across a projecting system which includes an optical system comprising a light source and a lens, the film being disposed between the source and the lens, a novel multi-condition field-defining device comprising:
a scanning disc having a first set of light passages so formed and located that when the scanning disc is continuously rotated and the film advanced a field of view is displayed by scanning, said scanning disc being formed with a second plurality of light passages located and formed that when the scanning disc is stationary and the second set are exposed a steady field of view is projected as the film is held stationary,
a motor for driving the scanning device,
a mask adapted to be angularly positioned either to expose or to mask the second set of passages,
means for normally biasing the mask so that said second formations are masked when the scanning disc rotates,
a multi-position switch adapted to order "scan," and "line" and "hold" conditions of operation,
control means for turning the motor on and off,

arresting means for holding the scanning disc, and

bias-overcoming means for moving the mask relative to the scanning disc so as to expose said second set of passages, said switch including means for actuating the control means so that the motor is on for the scan condition and off for the others, said switch further including means for actuating the arresting means so that the scanning disc rotates for the scan condition and is stationary for the others, the last-mentioned means moving the mask so that the mask causes the second set of passages to be closed for the scanning operation and open for the line operation.

3,907,418

FRAME SHIFTING DEVICE FOR A READER-PRINTER FOR A MICROFILM

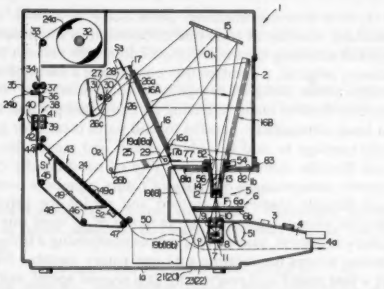
Susumu Okuyama, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1974, Ser. No. 447,632

Claims priority, application Japan, Mar. 5, 1973, 48-25826

Int. Cl.² G03B *27/00, 21/28*

U.S. Cl. 353—77 **4 Claims**



1. A reader-printer for microfilm frames having a screen for viewing a selected frame projected thereon and a device for copying a selected frame projected thereon, said copying device having a copying plane, comprising:

means for forming a light image of a selected microfilm frame and for projecting said image along a first optical axis;

a first reflector disposed on said first optical axis and reflecting the image projected along the first axis onto the copying plane of the copying device along a second optical axis;

a second reflector movable between a copying position in which it does not intersect said second optical axis and allows the light image to be projected from the first reflector onto the copying plane of the copying device and a viewing position in which said second reflector is in the path of the second optical axis and reflects the image projected therealong by the first reflector onto the viewing screen for viewing thereof;

first selector means manually movable between a viewing position and a copying position;

means responsive to moving the first selector means to the viewing position thereof to place said second reflector in the viewing position thereof and responsive to moving the first selector means to the copying position thereof to place the second reflector in the copying position thereof; an image rotating prism disposed on said first optical path and movable between a first position to cause a defined edge of the selected frame to be along a horizontal direction of the viewing screen when projected thereon and along a horizontal direction of the copying plane when projected thereon and a second position to cause said defined edge of the frame to be along a vertical direction of the viewing screen when projected thereon and along a vertical direction of the copying plane when projected thereon; and

means responnsive to moving the first selector means to its copying position for placing the image rotating prism to a selected one of its first and second position regardless of the position of the image rotating prism during viewing of the selected microfilm frame, whereby an elongated microfilm frame may be viewed on the screen with its long dimension either horizontal or vertical, but is always copied with its long dimension in a selected direction with respect to the copying device so that the same width copying paper may be used for all microfilm frames.

3,907,419

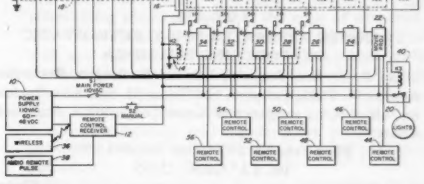
AUTOMATIC MULTI-VISUAL CONTROL SYSTEM

Norman P. Moran, 100 Arnaz St., Ojai, Calif. 93023

Filed Dec. 26, 1973, Ser. No. 427,879

Int. Cl.² G03B *21/26, 31/06*

U.S. Cl. 353—94 **6 Claims**



1. A multi-visual control system for operating a plurality of electrical display devices in predetermined combinations and sequences comprising:

a. a matrix switchboard having a plurality of columns of first and second adjacent connecting pins;

b. a stepping relay having a plurality of sections equal to the number of columns of the matrix switchboard with each section having a plurality of contacts equal to the number of connecting pins in each column; said stepping relay having a separate section connected to the first adjacent connecting pins of each column with each contact connected to a separate connecting pin;

c. an electrical device to be controlled connected to the second adjacent connecting pins of each column and to each section of the stepping relay;

d. a power supply connected to said electrical devices and said stepping relay;

e. means for sequentially advancing said stepping relay by applying a D.C. voltage from said power supply; and

f. means for connecting first and second adjacent connecting pins of said matrix switchboard in a preselected arrangement whereby each step of said stepping relay operates one or more electrical devices in a predetermined sequence.

3,907,420

MICROFICHE AND READER

George J. Yevich, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Division of Ser. No. 309,968, Nov. 28, 1972, Pat. No. 3,864,034. This application Aug. 13, 1974, Ser. No. 497,085

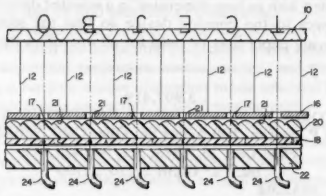
Int. Cl.² G03B *23/08*

U.S. Cl. 353—121 **2 Claims**

1. A method of recording macro scenes on an optical fiche, including the steps of:

a. projecting a macro scene through a mask provided with a plurality of apertures, said macro scene being spaced from said mask,

b. aligning the mask apertures with a unique set of optically active elements carried by a fiche whose bottom surface is provided with a photographic emulsion, the number of mask apertures being less than the number of optically active elements,



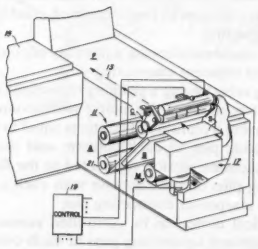
c. limiting the area of the macro scene projected into each individual mask opening by optically separating the mask openings from each other by opaque septa normal to the macro scene and to the mask openings,

d. whereby dispersed micro images of the projected macro scene are formed on the emulsion.

3,907,421
TRANSFER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES

William E. Jordan, Penfield; Edward B. Barton, Rochester; Kenton W. Fiske, Fairport, and Roger M. Swanson, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1974, Ser. No. 444,996
Int. Cl.² G03G *15/16*
U.S. Cl. 355—3 R **10 Claims**



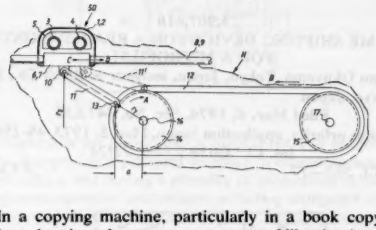
1. In an electrostatic reproducing machine wherein a latent image is formed and developed by image forming particles on a moving photoreceptor surface and a transfer roller is used to transfer the image onto a copy sheet, the improvement which comprises means for engaging said transfer roller into contact with the photosensitive surface to effect the image transfer when the machine is in operation and disengaging said transfer roller away from said photosensitive surface so that the transfer roller surface is not in contact with the photosensitive surface when the machine is not in operation; and

control means for generating an enabling control signal when said machine is conditioned to be ready to actuate a copy operation and for generating a disabling control signal when said machine completes a copy run or the machine operation enters into an interrupt mode due to jam or other malfunction conditions, said engaging and disengaging means responsive to said enabling control signal for engaging said roller in contact with said photoreceptor surface and responsive to said disabling control signal for disengaging said roller away from said photoreceptor surface.

3,907,422
APPARATUS FOR RECIPROCATING CARRIAGES IN COPYING MACHINES

Rudolf Eppe, Taufkirchen; Gunther Schnall, Eching; Walter Schott, Zorneding; Hermann Bronner, and Rudiger Ettelbruck, both of Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 28, 1973, Ser. No. 419,727
Claims priority, application Germany, Nov. 30, 1972, 2258669
Int. Cl.² G03G *15/28, 15/32*
U.S. Cl. 355—8 **8 Claims**

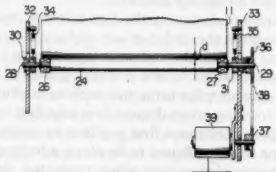


1. In a copying machine, particularly in a book copying machine wherein at least one component of illuminating and optical scanning means is reciprocable with respect to a stationary original, a combination comprising a carriage which is reciprocable along an elongated path; at least one elongated endless flexible element having an elongated portion which is at least substantially parallel to said path; means for coupling said carriage to said flexible element; and means for moving said flexible element at a plurality of substantially constant speeds, comprising a plurality of rotary members over which said flexible element is trained and means for driving said flexible element through the medium of at least one of said rotary members, said driving means comprising a transmission having means for rotating said one rotary member forwardly at a first speed and rearwardly at a second speed, said means for rotating said one rotary member comprising a first shaft rigid with said one rotary member, a second shaft, mating first and second gears respectively secured to said first and second shafts, first and second pulleys respectively mounted on and rotatable relative to said first and second shafts, first and second clutch means actuatable to respectively connect said first and second pulleys to said first and second shafts, and a constant-speed belt trained over and arranged to drive said pulleys.

3,907,423
EXCESS DEVELOPING LIQUID REMOVING DEVICE

Toshio Hayashi; Kazuo Goto, both of Yokohama; Osamu Haruyama, Urawa; Ichiro Fukushima, Tokyo, and Kunio Hibi, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1973, Ser. No. 422,791
Claims priority, application Japan, Dec. 22, 1972, 47-1257
Int. Cl.² G03G *15/10*
U.S. Cl. 355—10 **10 Claims**



1. In an electrophotographic copying apparatus including a moving photoreceptor, electrostatic charging means, expo-

sure means and transfer means, the combination comprising:

means for applying liquid developer onto the surface of the moving photoreceptor to convert an electrostatic latent image into a visible image;

a rotating roller means disposed adjacent to said liquid developer applying means for removing excess liquid developer from the surface of the moving photoreceptor to form a uniform film of liquid developer thereon;

means for supporting said rotating roller means to provide a gap between the periphery of said rotating roller means and the surface of the moving photoreceptor for thereby preventing said rotating roller means from damaging said visible image formed on the surface of the moving photoreceptor, said supporting means comprising a shaft on which said rotating roller means is rotatably supported, a pair of electrically insulated rollers rotatably supported on said shaft at opposite ends of said rotating roller means, said pair of electrically insulated rollers each having a diameter larger than that of said rotating roller means for thereby providing said gap, and biasing means for urging said pair of electrically insulated rollers into pressing contact with the surface of the moving photoreceptor;

driving means for rotating said rotating roller means such that the periphery of said rotating roller means moves at the gap in a direction substantially opposite to the direction of movement of the surface of the moving photoreceptor; and

means disposed in contact with the periphery of said rotating roller means for removing liquid developer therefrom.

3,907,424

COPYING APPARATUS

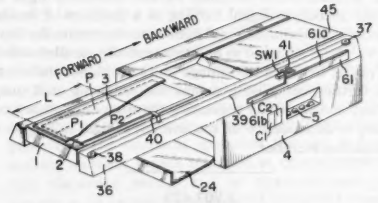
Shigehiro Komori, Yokohama, and Hajime Katayama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1973, Ser. No. 401,032

Claims priority, application Japan, Sept. 29, 1972, 47-97151

Int. Cl.[2] G03B *29/00*; **G06M** *1/00*; **B61L** *1/16*; **G06M** *7/00*

U.S. Cl. 355—29 **13 Claims**



1. A copying apparatus for forming an image of an original on a copy medium, which comprises:

a carriage adapted for reciprocating movement for supporting said original;

copy processing means for forming an original image on the copy medium;

means to grade a plurality of copy media bearing said original image thereon into a plurality of groups;

a number of copy counter means equal to the number of said grade groups for counting the number of copy mediums in each of said grade groups; and

means for actuating said copy counter means in response to the reciprocating movement of said carriage.

3,907,425

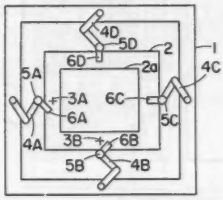
AUTOMATIC REGISTER MARK PRINTING CONTROL DEVICE IN AN ENGRAVING MACHINE

Itoi Isamu, Matsunoshita-cho 16, Tzumoji, Kita-ku, Kyoto, and Sugou Kiyoshi, Nagatsuda-cho 2251, Midori-ku, Yokohama, Kanagawa, both of Japan

Filed June 11, 1974, Ser. No. 478,239

Int. Cl.[2] G03B *27/52*, *27/42*, *27/44*

U.S. Cl. 355—40 **4 Claims**



1. An automatic register mark printing control device in an engraving machine, comprising:

register mark printing means comprising rotary solenoids provided at the ends of universal arms supported at one end to the base portion of a negative holder, and light-intercepting plates provided at the edge of actuators of said solenoids so as to cover the respective register marks with said light-intercepting plates whereby light applied to the register mark sections provided around a light-penetrating original image in a negative holder is selectively controlled to produce either irradiated or non-irradiated condition, said register mark printing means generating a signal upon completion of every positioning operation;

counter means responsive to the signal generated by said plural register mark printing means for counting the number of engraving operations completed in each of the X-axis and Y-axis directions during the engraving process;

numerical value setting means for previously setting the numerical value of the number of segments to be engraved in both X-axis and Y-axis directions according to the engraving layout;

comparison means responsive to said counter means and to said numerical value setting means for comparing the counted value of said number of engraving operations and the set value of the number of segments to be engraved; and,

selection control means responsive to said comparison means for selectively controlling said plural register mark printing means according to the result of comparison of said counted value and set value.

3,907,426

MICROFICHE PRINTER

Ronald Thomas Goodliffe, Westmarch, 61 Lansdowne Rd., West Worthing, Sussex, England

Filed Apr. 10, 1974, Ser. No. 459,514

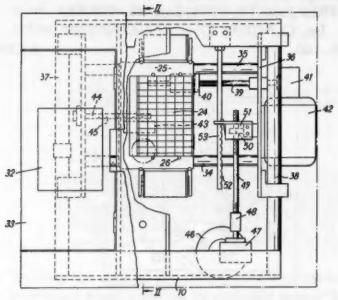
Claims priority, application United Kingdom, Apr. 13, 1973, 18004/73

Int. Cl.[2] G03B *21/18*, *21/26*

U.S. Cl. 355—53 **12 Claims**

1. Apparatus for forming microfiche from microfilm comprising projection means for projecting images from said microfilm, a table for supporting fiche material, and first and second drive means for displacing said table along two perpendicular axes to locate the areas on which an image is to be recorded in alignment with said projection means, wherein there is provided for each of said axes sensing means, a bar co-operating with each said sensing means and markings on each said bar at regular intervals corresponding to the re-

quired spacing of the imagess on said fiche, each said bar having a plurality of series of said markings corresponding to different fiche formats, one of said sensing means and said bar being mounted for movement with said table and the other



being fixed and said sensing means being connected to said first or said second drive means to stop the movement of said table each time said sensing means senses a marking on said bar.

3,907,427

LIGHTING ATTACHMENT FOR PHOTOGRAPHIC ENLARGERS

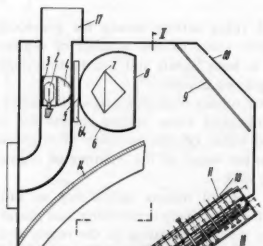
Werner Tschink, Nassauische Str. 4, 1 Berlin 31, and Rudolf Beger, Gerdsmeyer Weg 6b, 1 Berlin 42, both of Germany

Filed Jan. 11, 1974, Ser. No. 432,795

Claims priority, application Germany, Jan. 13, 1973, 2302113

Int. Cl.² G03B *27/54, 27/76*

U.S. Cl. 355—67 **14 Claims**



1. A lighting attachment for photographic enlarging devices for enlarging negatives comprising:

a light source for projecting an illuminated beam;

a semi-spherical hollow ball having a white internal wall surface with an input opening on its curved surface directed at said light source, and a light output opening disposed on the open flat portion of the ball opposite said input opening, said openings defining the optical axis of the ball;

a highly reflective double cone centrally disposed within said hollow ball and consisting of two cones having common bases with their vertexes defining an axis that is coaxial with the optical axis of said ball, wherein one cone reflects light from said light source onto the internal wall surface of said ball, and the other cone reflects light from the wall surface to the output opening;

a diffusion disk closing the output opening of the ball for diffusing the reflected light; and

a strip reflector disposed in the path of the light, said strip reflector having a surface for adjusting the reflection of the light before the light enters the photographic negative.

3,907,428

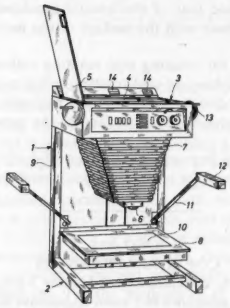
REPRODUCTION CAMERA HAVING A CONTROL CIRCUIT FOR AUTOMATIC REGULATION OF THE EXPOSURE TIME

Richard Arlund Norgaard, Ballerup, and Sven Nygaard, Nykobing Falster, both of Denmark, assignors to Eskofot A/S Industriparken, Ballerup, Denmark

Continuation of Ser. No. 298,396, Oct. 17, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,986

Int. Cl. G03b *27/76*

U.S. Cl. 355—68 **6 Claims**



1. In a reproduction camera having a control circuit for automatic regulation of the exposure time and comprising a supporting frame with three planes displaceable in relation to one another, said planes comprising an image plane, a copy plane and a lens plane, and further illuminating means for illuminating the object which is to be reproduced on a photosensitive medium, the improvement comprising light-sensitive means for continuously sensing the quantity of light from said illuminating means as modified by said object during exposure of said photosensitive medium by said modified light and providing an output signal varying as a function of incident light and means mounting said light-sensitive means for movement in a plane adjacent to and substantially parallel with the image plane, between said image and lens planes the control circuit further comprising means for receiving said output signal and automatically regulating the time of exposure continuously in dependence on the amount of light falling on the light-sensitive member.

3,907,429

METHOD AND DEVICE FOR DETECTING THE VELOCITY OF DROPLETS FORMED FROM A LIQUID STREAM

Lawrence Kuhn, Ossining; Robert A. Myers, New York; Keith S. Pennington, Somers, and Bankim R. Shah, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,696

Int. Cl.² G01P *3/36;* **G01F** *1/00;* **G01D** *21/04, 15/18*

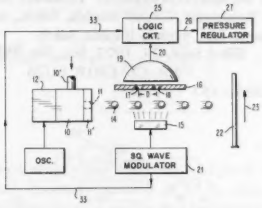
U.S. Cl. 356—28 **14 Claims**

1. A device for detecting the velocity of droplets formed from a liquid stream including:

means forming a pair of apertures spaced from each other a fixed distance related to the design wavelength of the droplets, said apertures being disposed on one side of the path of the droplets;

light source means directed toward said apertures and disposed on the opposite side of the path of the droplets;

means to strobe said light source means at a selected frequency related to the frequency of generation of the droplets;



first means to detect when a droplet blocks each of said apertures;

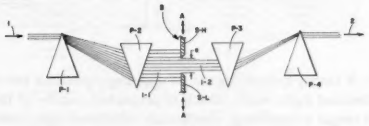
and second means to detect the velocity of the droplets in accordance with when each of said apertures is blocked and the selected frequency of said strobing means.

3,907,430

OPTICAL BANDPASS FILTER

Michael Martin Mann, Redondo Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 13, 1973, Ser. No. 388,026
Int. Cl.[2] G01J *3/14*; G02B *5/04*
U.S. Cl. 356—100 **25 Claims**



1. An improved technique for optical filtering and removal of selected lines from a prescribed radiation bandwidth, doing so without otherwise significantly affecting radiation characteristics such as relative spatial or angular relationship of the rest of the lines, this technique comprising in combination:

projecting the entrant bandwidth through prescribed dispersive means functioning to spread the band and then recombine it, collimatingly without significant distortion; projecting the resultant spectrum through a first prescribed mergent means matched in characteristics with said dispersive means and so disposed with respect thereto as to produce a prescribed expanded bandwidth representing said original input lines, however, spaced apart further and kept collimated

intercepting prescribed radiation lines to remove them with prescribed opaque stop means;

merging the resultant "filtered" bandwidth using prescribed mergent means functioning to merge this bandwidth and recombine it, collimatingly and without significant distortion

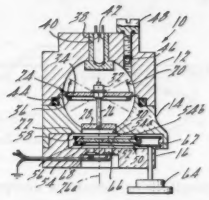
reconstituting and recollimating the resultant spectrum so merged with prescribed companion collimation means matched with said mergent means and disposed with respect thereto to produce a collimated output substantially the same as said input and colinear therewith, except for said line removal; said dispersive means and mergent means being matched in symmetrical complementarity.

3,907,431

MAGNETIC HEADING REFERENCE

John A. McDougal, 2314 E. Court St., Flint, Mich. 48503

Filed Nov. 19, 1973, Ser. No. 416,741
Int. Cl.[2] G01J *4/00*; G01N *21/40*
U.S. Cl. 356—114 **28 Claims**



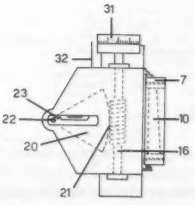
1. Means for detecting relative angular displacement comprising: a source of unpolarized light; polarizing means disposed in the path of light from said source to cause the light passing therethrough to be polarized; analyzing means disposed in the path of said polarized light comprising a central polarized area and an outer polarized area surrounding said central polarized area, said central and outer polarized areas being arranged to have their respective directions of polarization at an angle to each other; a first photo-responsive means positioned to receive the light which first passes through said polarizing means and then through said central polarized area of said analyzing means; and a second photo-responsive means positioned to receive the light which first passes through said polarizing means and then through said outer polarized area of said analyzing means; said analyzing means and said polarizing means being angularly displaceable relative to each other.

3,907,432

ROTATING OPTICAL WEDGE DEVICE

Franco Bersani, Via A. da Sangallo, 10, Piacenza, Italy

Filed Sept. 17, 1973, Ser. No. 397,912
Claims priority, application Italy, Sept. 20, 1972, 29421/72
Int. Cl. G01b *11/26*
U.S. Cl. 356—138 **10 Claims**

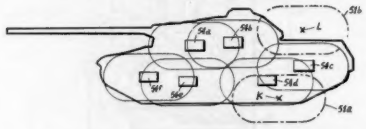


1. A device for the exact measuring of close angles, essentially comprising an optical wedge and a topographical telescope, wherein said optical wedge is mechanically connected to said telescope and able to rotate about the optical axis thereof by any carefully measurable angle, being further provided a mechanical gear connected to the wedge and suitable to operate the rotation of said wedge and a reading means connected with said mechanical gear and provided with helical graduations relating to angles which are functions of the wedge rotation angle.

3,907,433
MOVING TARGET FIRING SIMULATOR AND A METHOD OF ADJUSTMENT OF SAID SIMULATOR

Jacques Nault, 56, avenue Emile Zola, Paris 15° (Seine), France

Filed Oct. 19, 1973, Ser. No. 407,964
Claims priority, application France, Nov. 3, 1972, 72.38883
Int. Cl. G01b 11/26
U.S. Cl. 356—152 14 Claims

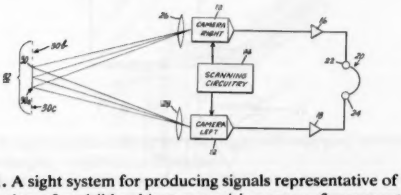


1. A moving target firing simulator comprising a weapon having a firing axis and equipped with a generator which produces electromagnetic pulse trains of short wavelength and is controlled by the firing mechanism of said weapon, a convergent optical system for concentrating said pulse trains into a narrow beam directed to the target, said beam forming at its intersection with said target a spot having a predetermined contour and whose center travels on an envelope when the beam is moved with respect to the target, means for displacing the axis of said beam through a predetermined angle with respect to the firing axis, and photosensitive receivers distributed on target faces, wherein said simulator comprises a screen pierced by an opening which forms an object for the optical system, said screen being placed between the pulse-train generator and the optical system, and wherein the contour and the dimensions of said opening, the distance between said opening and said optical system, the distribution of the photosensitive receivers on one lateral face of the target, are so determined that the envelope of the center of the spot remains practically inscribed within aa simplified perimeter of the lateral face of the target when the spot is displaced around said target with the contour of said spot maintained approximately tangent to said photosensitive receivers.

3,907,434
BINAURAL SIGHT SYSTEM

Donald K. Coles, Fort Wayne, Ind., assignor to Zipcor, Inc., Fort Wayne, Ind.

Filed Aug. 30, 1974, Ser. No. 502,033
Int. Cl.² G01B 11/26; G01D 21/04
U.S. Cl. 356—152 12 Claims

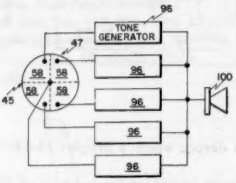


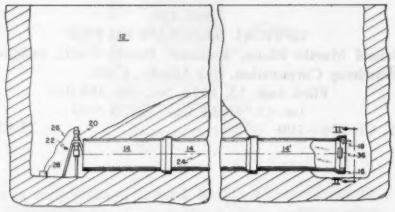
1. A sight system for producing signals representative of the location of a visible object comprising means for generating first and second time related signals at an audible frequency, two electrically operable stimulating devices connected to said signal-generating means for activating each of said devices in response to said first and second signals, respectively; said signal-generating means including two electronic camera devices that generate image signals representative of optical images projected thereonto, means positioning said camera devices in horizontally spaced relation to have overlapping fields of view, said stimulating devices also being held in horizontally spaced relation, signal circuitry independently connecting the right and left camera devices to the right and left stimulating devices, respectively, and means for synchronously scanning said camera devices in opposite directions over the respective fields of view, the right-hand camera devices scanning from right to left and the left-hand camera device from left to right.

3,907,435
LIGHT BEAM ALIGNMENT TARGET AND METHOD

Roger J. Roodvoets, Grand Rapids, Mich., assignor to Laser Alignment, Inc., Grand Rapids, Mich.

Filed Sept. 29, 1972, Ser. No. 293,312
Int. Cl.² G01B 11/26
U.S. Cl. 356—153 2 Claims





1. A target system for use in aligning pipes to a pre-aligned collimated light beam which is projected axially of the pipe, said target comprising: electrically operated light beam sensing means positionable at an end of a pipe section to intercept said beam and adapted to generate a signal when in alignment with said beam; said light beam sensing means including a plurality of photosensing elements arranged in a predetermined pattern, said sensing elements being adapted to generate a signal in response to impingement of said beam on said sensing elements, and indicating means responsive to said signal from said sensing means to indicate alignment of said beam with said sensing means, said indicating means including tone generating means responsive to signals from said sensing means to produce an audible indication of the position of said sensing means with respect to said light beam.

2. The apparatus as defined in claim 1 wherein said light beam is pulsed and said photo-sensing elements are responsive only to said pulsed light beam.

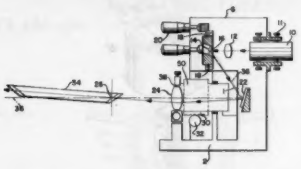
3,907,436
OPTICAL ALIGNMENT DEVICE PROVIDING A VIRTUAL PIVOTING LASER

George J. Wolga, P.O. Box 730, Ithaca, N.Y. 14850

Filed Feb. 5, 1974, Ser. No. 439,948
Int. Cl. G01b 11/26
U.S. Cl. 356—153 6 Claims

1. The combination with a means for emitting a beam of radiant energy, means to allow variation in the direction of the beam and means to guide such beam in a path such that the beam always passes through a virtual pivot point in space at a distance from the emitting means while the direction of the beam passing through such virtual pivot point varies in at least two orthogonal directions, means defining a real pivot point

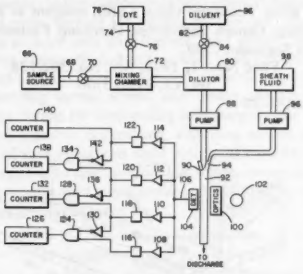
along said path, including means for imaging the beam from said real pivot point at said virtual pivot point, and means mounting said imaging means for movement with respect to said variation allowing means along its axis to vary the distance of the virtual pivot point from the real pivot point and in two orthogonal directions transverse to its axis independently of the direction varying means and the real pivot point defining means.



3,907,437
CELL CLASSIFICATION SYSTEM

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Apr. 26, 1973, Ser. No. 354,747
Int. Cl. G01n *21/22*
U.S. Cl. 356—156 **12 Claims**



1. Method of determining the comparative shape of cell nuclei of a population of cells characterized in having the same mass of nuclear DNA in each cell, and comprising the steps of

measuring for each of said nuclei the magnitude of a shape-dependent function other than volume, which is proportional to the concentration of DNA in said each of said nuclei, and

comparing said magnitude with a differently determined value of said function for the same concentration of DNA, whereby to obtain from the comparison a value which is indicative of the shape of said nuclei.

3,907,438
CONTOUR MEASURING SYSTEM FOR CYLINDERS

John M. Holeman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

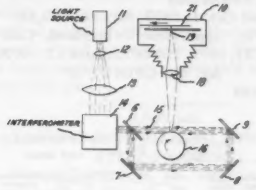
Filed June 22, 1973, Ser. No. 372,768
Int. Cl. G01b *11/24*
U.S. Cl. 356—156 **12 Claims**

1. A contour measuring system for cylindrical surfaces comprising:

a source of a plurality of parallel sheets of collimated light;

a cylindrical surface having the axis thereof approximately parallel to the plane of said sheets, said cylindrical surface positioned so that said light sheets have a non-zero angle of incidence with respect to said surface; and

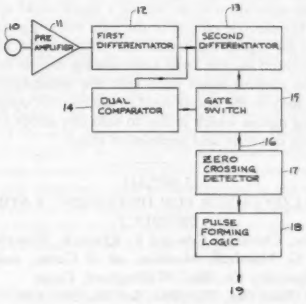
slit camera means for recording the contour of said surface at the intersection of said light sheets and said surface.



3,907,439
EDGE-SENSING WITH A SCANNING LASER BEAM

Carl A. Zanoni, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Continuation-in-part of Ser. No. 388,267, Aug. 14, 1973, Pat. No. 3,856,411, which is a continuation-in-part of Ser. No. 368,441, June 8, 1973, abandoned. This application Apr. 24, 1974, Ser. No. 463,654
Int. Cl.[2] G01B *11/04, 11/10*
U.S. Cl. 356—160 **2 Claims**



1. An electrooptical edge-sensing device comprising (A) a source of radiant energy which produces a narrow beam; (B) means for scanning said beam and passing at least a portion thereof past an edge of an object; (C) means for collecting and photosensing said portion of said beam passing said edge to produce a first set of signals; (D) means to differentiate said first signals to produce a second signal with maximum intensity at points corresponding to said edge of said object; (E) means to further differentiate said second signal to produce a third signal of zero intensity at points corresponding to said edge of said object; (F) means to feed a portion of said second signal to a switch to which said third signal is also fed, which switch passes said third signal only for a limited period adjacent the peak of said second signal; and (G) means to utilize the signal from said switch in measuring the position of said edge.

3,907,440
OPTOELECTRICAL APPARATUS

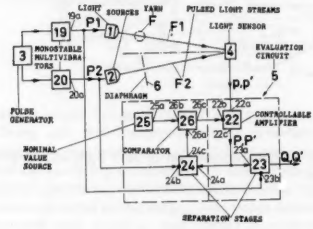
Werner Eichenberger; Karl Lapp, both of Zurich; Erich Loepfe, Zollikerberg, and Hansruedi Stutz, Dietlikon, all of Switzerland, assignors to Aktiengesellschaft Gebruder Loepfe, Zurich, Switzerland

Filed Oct. 1, 1973, Ser. No. 402,187

Claims priority, application Switzerland, Oct. 16, 1972, 15184/72; Dec. 21, 1972, 18649/72; June 15, 1973, 8682/73

Int. Cl.[2] G01N *21/18*

U.S. Cl. 356—199 **20 Claims**



1. An optoelectrical apparatus, comprising light transmitting means for generating at least two pulsed light beams in such a manner that the light pulses of each beam follow the light pulses of the other beam in alternate sequence, said light transmitting means including at least two light sources and means for generating in alternate sequence at least two series of electric pulses which are individually supplied to the light sources, light receiving means including light sensing means responsive to light generated by the light transmitting means and producing an electric output representative of the waveform of the received light, and electronic evaluation means operatively connected to the output of the light sensing means and comprising means for separating from said electric output at least one electric signal originating from one of said pulsed light beams, said separating means including at least one controllable separation stage having a signal input and a control input, the electric output of the light sensing means being supplied to the signal input and one of said series of electric pulses generated by the light transmitting means being supplied to the control input such that the separation stage is responsive only to the component of the electric output of the light sensing means which is due to said one series of electric pulses which controls said separation stage.

3,907,441
SEALED CONTAINER FOR DISPENSING A VOLATILE PRODUCT

Eric J. Idec, Cheshire; Edward F. Klimeck, Waterbury, and Francis G. Marshall, Meriden, all of Conn., assignors to Eyelet Specialty Co., Inc., Wallingford, Conn.

Filed Dec. 30, 1974, Ser. No. 537,430

Int. Cl.[2] A45D *40/06*

U.S. Cl. 401—75 **13 Claims**

1. A swivel-action dispensing container for a paste product having volatile ingredients, comprising a moldedplastic tubular container body having a cylindrical bore within a body wall and open at one end, said body having a closure-wall formation comprising a relatively thin-walled seal sleeve concentric within the cylindrical bore and a compliant frusto-conical wall integrally connecting one end of said sleeve to said body wall, whereby said seal sleeve has a degree of compliant yieldability as to its axis orientation with respect to the bore axis, a molded-plastic actuator comprising a bearing portion rotatably received in the sleeve region of said closure wall and integrally including (*a*) an elongate threaded stem projecting upward with the bore and (*b*) an externally exposed actuating base, said bearing portion including two circumferentially continuous seal beads having slight interference-fit relation with the bore of said sleeve, a carrier threaded to said threaded portion and having a periphery in guided relation with said body bore, elongate key means coacting between said body bore and said

carrier for preventing carrier rotation within said body bore, and a removable closure cap having snap-sealing engagement with the open end of said body wall.

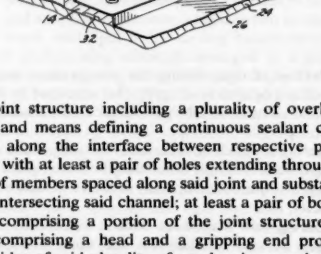
3,907,442
FASTENER SEALANT INJECTION SYSTEM

Bruce D. Reid, Thousand Oaks, Calif., assignor to Briles Manufacturing, Omark Industries, Precision Fastening Subsidiary, El Segundo, Calif.

Filed Nov. 1, 1972, Ser. No. 302,735

Int. Cl. F16b *5/00*

U.S. Cl. 403—37 **3 Claims**

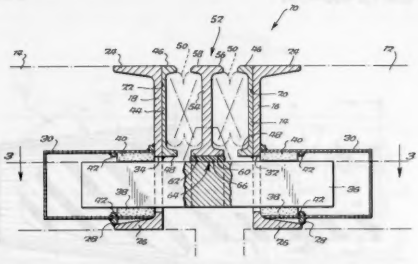


1. A joint structure including a plurality of overlapping members and means defining a continuous sealant channel extending along the interface between respective pairs of members, with at least a pair of holes extending through said plurality of members spaced along said joint and substantially centrally intersecting said channel; at least a pair of bolt-type fasteners comprising a portion of the joint structure, each fastener comprising a head and a gripping end proximate opposite sides of said plurality of overlapping members, and a shank engaged through respective ones of said holes, each of said fasteners having an injection bore opening at one of said ends and extending into the shank to a position proximate said channel, each of said fasteners having a radially extending injection port means in communication with said bore, said port means extending entirely through the wall of said shank and terminating at least in part in said channel, and further wherein the width of said channel is greater than the diameter of each of said fasteners in the area of the ports, said channel further providing communication between said fastener injection ports, and said bore and port means in said fasteners providing a flow path for the injection of flowable sealant into said channel and along the length thereof, whereby the length of said channel may be supplied or resupplied with sealant without disturbing the fasteners after assembly of the joint structure.

3,907,443
COMPOSITE EXPANSION JOINT ASSEMBLY

Ronald L. McLean, Tonawanda, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,222
Int. Cl.[2] E01C *11/12*
U.S. Cl. 404—56 4 Claims

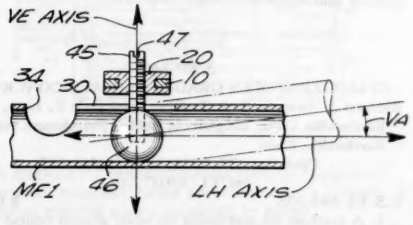


1. A composite expansion joint assembly comprising: edge members adapted to define the opposite sides of an expansion groove between deck sections; at least two resiliently yieldable elongated sealing elements in side-by-side relation; an elongated rigid structural member interposed between said sealing elements; support bars extending transversely of said rigid structural member and being connected thereto for supporting the same; means supporting said support bar adjacent the opposite ends thereof for sliding movement relative thereto adjacent at least one end thereof; and elastic, non-metallic, means for resiliently separating said rigid structural member from said support bars for limited movement relative thereto for absorbing noise, stress and strain therebetween and mounting means for connecting said support bar to said rigid structural member comprising, fastening means secured to a surface of said elongated rigid structural member and means fixidly secured to said support bar for receiving said fastening means wherein said rigid structural member is substantially anchored to said support bar.

3,907,444
PIVOT JOINT HAVING AT LEAST FOUR DEGREES OF FREEDOM

Gene W. Arant, 2444 Jupiter Dr., Los Angeles, Calif. 90046

Division of Ser. No. 324,957, Jan. 19, 1973, Pat. No. 3,854,208. This application Sept. 24, 1973, Ser. No. 399,808
Int. Cl. F16c *11/00*
U.S. Cl. 403—77 4 Claims

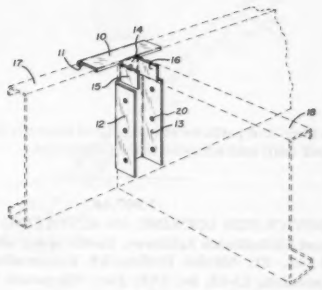


1. A pivot joint having four degrees of freedom, comprising:
an empty tubular member having an empty longitudinally extending slot formed in a wall portion thereof;
a sphere seated within said tubular member in free axially slidable and rotatable engagement with the interior circumferential wall surface thereof;
a post having its longitudinal axis substantially aligned with the radius center of said sphere;
one end of said post extending through said slot and being fixedly attached to said sphere whereby said tubular member may slide in the direction of its own longitudinal axis relative to said sphere and post, may twist about said sphere in a plane perpendicular to the longitudinal axis of said post, and may also twist about said sphere in a plane in which said post lies; and
the width of said slot being greater than the diameter of said one end of said post whereby said tubular member may also rotate about its own longitudinal axis relative to said sphere and post.

3,907,445
SELF-ALIGNING JOIST HANGER FOR STRUCTURAL STEEL FRAMING

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,698
Int. Cl.[2] F16B *5/00*
U.S. Cl. 403—232 2 Claims



1. In a hanger for mounting hollow metal joists perpendicular to headers and the like, including a U-shaped top flange for hanging the hanger, and a backplate suspended from the hanger with side flanges projecting outward from the backplate for connection to a joist, the improvement comprising: the side flanges each divided from the backplate outward at a point intermediate to the top and bottom thereof thereby forming a spaced top and bottom portions of the side flanges, and with the distance between the top portions of the side flanges being less than the distance between the bottom portions of the side flanges, wherein said side flanges are unconnected except by the backplate to define a channel open at both ends thereby enabling them to accommodate any height joist, and whereby a joist to be attached to the side flanges is supported by the spaced together top portions of the side flanges while the joist is being attached to the remaining portion of at least one of the side flanges.

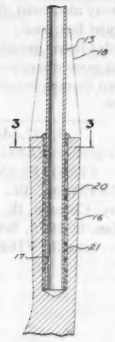
3,907,446
SHANK AND SOCKET JOINT AND METHOD OF MAKING SAME

Gurdon Leslie, North Madison, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed May 4, 1972, Ser. No. 250,341
Int. Cl. F16l *13/10*
U.S. Cl. 403—268 6 Claims

1. A shank and socket joint for joining a loosely fitting shank of one member to means affording a mating socket cavity of another member; said mating socket cavity being of substantially larger cross-sectional dimension than said shank and providing a substantially uniform clearance around said shank; a hardenable thixotropic adhesive material disposed at rest said clearance; small, solid, relatively heavy discrete particles disposed throughout said adhesive material at random spaced intervals in said clearance for maintaining uniform spacing of said shank with respect to said socket cavity and centering said shank within said socket cavity, said thixotropic

adhesive material in said initially flowable form having the characteristic of increasing its viscosty when at rest so as to



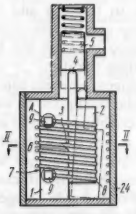
maintain said particles at said spaced intervals and center said shank until said adhesive material hardens.

3,907,447

DEVICE FOR LOCKING AN ACTUATING ELEMENT

Alexei Mikhailovich Arkharov, Yartsevskaya ulitsa 28, korpus 1, kv. 51; Nikolai Trofimovich Romanenko, Tokmakov pereulok, 13-15, kv. 165; Jury Filippovich Nikitin, ulitsa Arbat, 18, kv. 31, and Ljudmila Anatolievna Litenkova, Bashilouskay ulitsa, 19, kv. 158, all of Moscow, U.S.S.R.

Filed Nov. 16, 1973, Ser. No. 416,631
Int. Cl.[2] G05G *5/00*
U.S. Cl. 403—316 **8 Claims**



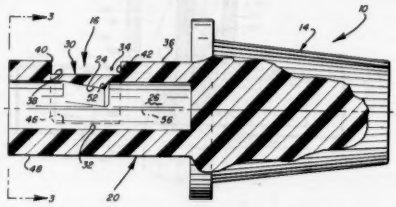
1. A device for locking an actuating element in a preset position comprising: a support; a catch mating with said support and forming, together with it, a lock, the mating surfaces of said support and catch having a recess on one of them and a projection on the other, said recess and projection being engaged while locking said actuating element, the external surface of said lock having a portion comprising a solid of revolution; a retainer for fixing the relative positions of said support and catch while locking said actuating element, said retainer comprising a torsional spring mounted on said solid of revolution; means for holding said spring from untwisting while locking said actuating element and allowing it to untwist while unlocking said actuating element, said means being located on said lock and connected with at least one end of said spring, said spring having an inside diameter in the free state larger than the outside diameter of said solid of revolution by at least the lateral dimensions of said projection.

3,907,448

KNOB

Richard W. Kolibar, Parma, and Robert F. Rupnik, Brooklyn, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 19, 1974, Ser. No. 443,464
Int. Cl.[2] F16D *1/06*
U.S. Cl. 403—361 **1 Claim**



1. A one-piece, molded knob for use in turning a control shaft having a leading end of generally "D" shaped cross-section comprising a generally flat outer surface and a generally arcuate outer surface, said knob comprising a manually engageable head portion and a tubular stem integrally formed with and projecting outwardly from said head portion, said stem comprising an outer stem wall which at least partially defines a longitudinally extending chamber for receiving a portion of the leading edge of the control shaft, said chamber being of a generally D shaped cross-section being defined by a generally flat inner surface and a generally arcuate inner surface, retainer means integral with said outer stem wall for retaining the control shaft in said chamber, said retainer means comprising surface means extending from said arcuate inner surface and inclined in the direction of insertion of the shaft into said chamber, said retainer means located in a position for engagement with the leading end of the control shaft for resiliently deflecting a portion of said outer stem wall radially outwardly as the control shaft is inserted into said chamber and for pressing the control shaft against a longitudinally extending inner surface of said chamber under the influence of the resiliently deflected portion of said outer stem wall, said outer stem wall adjacent to said retainer means being recessed and relatively thinner than the adjacent portions of said outer stem wall.

3,907,449

STABILIZING OPEN GRADED ASPHALT-CONCRETE

Richard J. Bennett; Lew T. Gray, and Dale F. Levy, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1974, Ser. No. 501,203
Int. Cl.[2] E01C *7/06*
U.S. Cl. 404—75 **8 Claims**

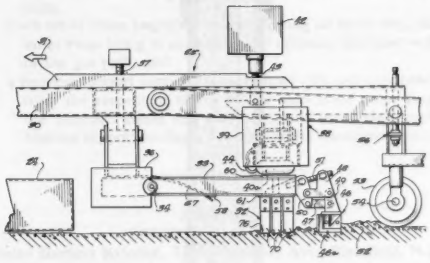
1. A method for stabilizing an open graded course of asphalt-concrete against lateral displacement under a moving load, said method comprising:

1. causing particulate matter to be passed into the interstices of said asphalt-concrete course, said particulate matter sized in a range sufficiently small to enter the interstices, and
2. consolidating the particulate matter within the interstices with an emulsion comprising a thermoplastic elastomer, a resinous material, and a polar solvent.

3,907,450
SCARIFIER FOR USE WITH ASPHALT CONCRETE ROADWAY REFINISHING APPARATUS

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving, Inc., Lawrence, Kans.

Filed May 6, 1974, Ser. No. 467,067
Int. Cl.² E01C *23/14*
U.S. Cl. 404—90 **25 Claims**

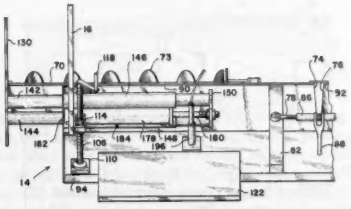


1. A scarifier assembly for engagement with a road surface to excavate the road surface, comprising: a support frame adapted to be moved over the road surface in a given direction, a plurality of scarifying blade units secured to said support frame for separate selective upward and downward movement and positioned to have cutting tips thereof engageable with the road surface when in the down position during a scarifying operation, and a plurality of discrete yieldable fluid operated pressure applying means positioned beneath said support frame and directly over said plurality of scarifying blades to apply a downward pressure directly upon said scarifying blades during the sacrifying operation.

3,907,451
EXTENSIBLE SCREED AND AUGER ASSEMBLY FOR A ROAD PAVING MACHINE

Robert F. Fisher, Wakeman, and Kenneth A. Kuhl, Milan, both of Ohio, assignors to Lay-Mor Manufacturing Company, Wakeman, Ohio

Filed Jan. 28, 1974, Ser. No. 436,841
Int. Cl.² E01C *19/12*
U.S. Cl. 404—101 **14 Claims**



1. A machine for spreading paving material comprising:

a. material transport means for transporting a quantity of paving material over a surface to be paved,

b. said transport means including discharge means for depositing the paving material on the surface to be paved,

c. extensible strike-off means connected to said transport means and positioned rearwardly of said discharge means for leveling and smoothing the paving material as it is deposited on the surface to be paved,

d. said strike-off means including a laterally stationary first member and a second member connected to said first member for lateral movement relative thereto,

e. a rotatable auger mounted on and carried by said second member and positioned between said discharge means and said strike-off means, and

f. means for laterally extending and retracting said second member and said auger.

3,907,452
TOOL GUIDE

Walter C. Tripp, 5590 Briarhills Ln., Reno, Nev. 89502

Filed Oct. 1, 1973, Ser. No. 402,101
Int. Cl.² B23B *45/14*
U.S. Cl. 408—56 **6 Claims**

1. A hand-held workpiece engaging tool for drilling and the like comprising:

a hollow housing having an elongated upper bearing guide and gripping section and a lower workpiece engaging section;

the housing upper section including a central elongated internal bearing surface and an external surface suitable for gripping by the user at a distance from a work surface; the housing lower section being substantially wider than the housing upper section and having both a wide and deep inwardly tapering cut out section for engaging circular workpieces of varying diameter and other non-planar workpieces, and also having a flat end surface for engaging flat workpieces;

an elongated cylindrical shank longer than the housing which extends down therethrough and is smooth surfaced and dimensioned to give a bearing fit for both rotative and longitudinal movement with respect to the internal bearing surface;

the shank including a chuck having adjustable jaws for holding a tool at its lower end, and an elongated shaft at its upper end for engaging power tool members;

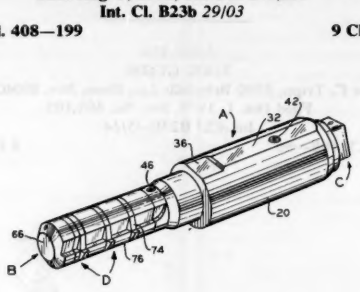
spring means positioned on the outside of and extending above the housing clear of the shank for providing longitudinal spring bias of the shank with respect to the housing, the spring having an inner diameter substantially greater than the external dimensions of the shank for assuring sufficient clearance therefrom to permit unrestricted longitudinal movement between the spring and shank; and

the shank being connected to the spring through an adjustable rotative bearing and stop assembly including a collar fixedly connected to the shank, and an intermediate bearing member disposed between the upper end of the spring, and, the collar and the bearing member having flat planar bearing surfaces in engagement with each other.

3,907,453
CUTTING TOOL HOLDER

Gene Lee Bennett, North Madison, Ohio, assignor to Genio Tools, Inc., Mentor, Ohio

Filed Aug. 3, 1972, Ser. No. 277,636
Int. Cl. B23b 29/03
U.S. Cl. 408—199 9 Claims



1. A new tool member and tool holder for use therewith of the type including an elongated holder body adapted to be affixed to a conventional metal removal machine, said body having an elongated tool mounting shaft extending coaxially outwardly from said holder body, said tool mounting shaft including a front end face disposed generally normally to said mounting shaft and a tool member receiving recess extending longitudinally inwardly from said front end face, said recess including a circular wall portion extending longitudinally into said mounting shaft and a single slot opening from said circular wall radially through said mounting shaft, said slot having planar walls at right angles to one another and intersecting said circular wall portion at circumferentially spaced locations thereabout, said tool member including:

a circular mounting portion dimensioned to be received within said circular portion of said recess in a desired axial position relative to said mounting shaft and

a tool element portion rigidly affixed to said mounting portion and extending generally radially outward therefrom through said slot, said tool element portion including a tool cutting area generally disposed at the outermost radial surface thereof and planar sides disposed in said slot in facial engagement with said planar walls of said slot to prevent rotation of said tool member relative to said mounting shaft, and

a retaining cap dimensioned to be received over said recess and said tool member and attached to said shaft in locking relationship thereto.

3,907,454
COMPRESSED GAS MACHINE

George C. Punton, 10977 Horizon Hills, El Cajon, Calif. 92020

Filed May 20, 1974, Ser. No. 471,335
Int. Cl.[2] F03B 9/00
U.S. Cl. 415—5 3 Claims

1. A compressed gas machine comprising:

an endless belt loop, said belt loop carried by and coupled to at least first and second sprocket members;

at least one support means rotatably carrying said first and second sprocket members;

a plurality of inflatable buoyancy bladders carried by said belt loop;

said first sprocket members rotatably disposed within a liquid medium;

a majority of said inflatable buoyancy bladders being disposed within said liquid medium;

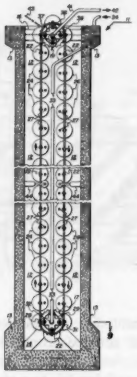
said second sprocket means rotatably disposed vertically above said first sprocket member;

a compressed gas source coupled to a gas supply line;

a filler valve coupled to said gas supply line;

a cam coupled to said first sprocket means in operable proximity with said filler valve, said filler valve being adapted for axial reciprocating movement;

each of said inflatable buoyancy bladders having a filler dump valve positioned for cooperation with said filler valve;



a dump valve cam coupled to said second sprocket member;

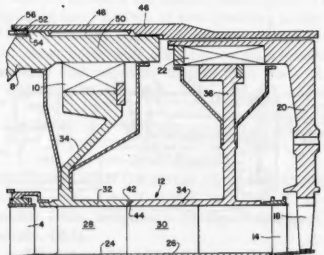
a dump valve disposed in operable relationship with said dump valve cam and being adapted for axial reciprocating movement and further disposed for cooperation with said filler dump valves; and

an exhaust line coupled to said dump valve.

3,907,455
INTERMEDIATE COMPRESSOR CASE FOR GAS TURBINE ENGINES

William G. Monsarrat, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 7, 1974, Ser. No. 440,407
Int. Cl.[2] F04D 25/16, 29/64
U.S. Cl. 415—68 6 Claims



1. An intermediate case for a split compressor in which a low pressure compressor component having a rotor and surrounding casing discharges gas through the intermediate case to a high pressure compressor component also having a casing surrounding a rotor in alignment with the low pressure rotor, said intermediate case including:

cooperating outer rings on the adjacent ends of the low pressure and high pressure casings extending toward and into engagement with one another, said rings being in alignment and defining the outer wall of the gas path through the intermediate case, and

said rings having flanges on the abutting ends for attachment of the casings and said rings together,

releasable attachment means holding said flanges together, each ring having struts extending inwardly across the gas path,

each set of struts engaging and supporting an inner ring, the inner rings being in alignment and defining the inner wall of the gas path, and

a bearing support carried by each inner ring and supported from the respective casing by the associated outer ring, the attached struts and the associated inner ring, each bearing support having a bearing for the associated rotor.

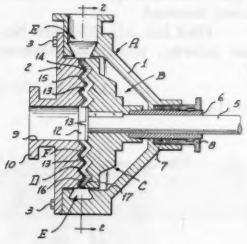
3,907,456
CENTRIFUGAL PUMP

Heinz Herbert Krienke, 1130 Thornton Ave., Plainfield, N.J. 07060

Continuation-in-part of Ser. No. 40,773, May 27, 1970, abandoned. This application Nov. 18, 1971, Ser. No. 200,106

Int. Cl.[2] F04D *1/04*

U.S. Cl. 415—71 **11 Claims**



1. A centrifugal pump comprising a housing having an inlet conduit, an impeller journaled to rotate in said housing coaxially with said inlet conduit and having an inlet opening, and means including a drive shaft for driving said impeller, said housing also having an outlet conduit at the outer periphery of said impeller and there being a plurality of pumping passages spaced circumferentially of said impeller leading outwardly from said inlet opening through said outer periphery of the impeller, each passage having end walls radiating outwardly continuously from said inlet opening to the outer periphery of the impeller and side walls each of which has an undulated surface whose undulations are in spaced opposed relation to the undulations of the undulated surface of the other side wall and inclined in the same directions to a diametral plane of the impeller for causing the stream of fluid in each passage to be repeatedly ricocheted or deflected by the undulations of one surface to the undulations of the other surface in directions toward said periphery of the impeller and inclined to a diametral plane of the impeller, as the fluid is centrifugally impelled through the passage.

3,907,457
LABYRINTH STRUCTURE FOR AIR OUTLET OF GAS TURBINE ENGINE BEARING CHAMBER

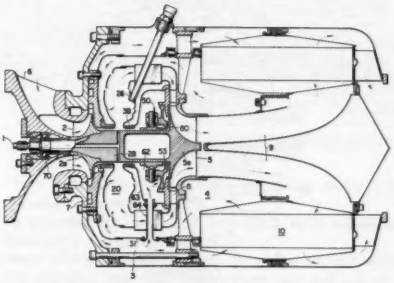
Kenya Nakamura, Okazaki, and Hiroshi Okano, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 20, 1973, Ser. No. 389,813

Claims priority, application Japan, Aug. 21, 1972, 47-82856

Int. Cl. F01d *11/04;* **F02c** *7/10, 7/06*

U.S. Cl. 415—112 **2 Claims**



1. In a gas turbine engine including a turbine main shaft, a turbine connected to said main shaft for rotation therewith, a bearing chamber formed around said main shaft in the vicinity of said turbine, means for supplying cold air to said bearing chamber, a gas bearing mounted within said bearing chamber for supporting a high temperature side of said main shaft, and means for controllably exhausting air from said bearing chamber, the improvement wherein said air exhaust means comprise

a first plurality of generally concentric annular projections formed on a stationary wall portion of said turbine engine, said first projections being spaced apart radially of said turbine shaft and extending in a direction axially thereof to define annular spaces therebetween,

a second plurality of generally concentric annular projections formed on a wall portion of said rotatable turbine, said second projections being spaced apart radially of said turbine main shaft and extending in a direction axially thereof to define annular spaces therebetween,

said first and said second projections being arranged in a staggered opposed relationship with each of the projections of one of said plurality of projections extending into the annular spaces formed between the other of said plurality of projections, and

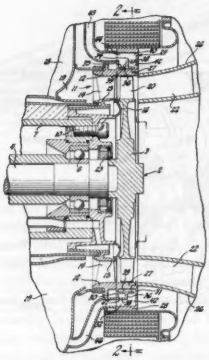
a plurality of thin walled annular plates affixed to each of the projections of at least one of said plurality of projections, said plates being located to extend diametrically from the projections to which they are affixed and transversely across said spaces formed between said other plurality of projections, said plates terminating short of engagement with the projections of said other plurality of projections to define a spacing therebetween,

said first and said second plurality of projections being located to define a labyrinthine flow path for air exhausting from said bearing chamber, said labyrinthine flow path as defined by said first and second plurality of projections being located between said turbine and said gas bearing.

3,907,458
TURBOMACHINE WITH EVENLY COOLED TURBINE SHROUD

Sidney G. Liddle, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 9, 1974, Ser. No. 504,034
Int. Cl.[2] F01D 5/08
U.S. Cl. 415—115 2 Claims



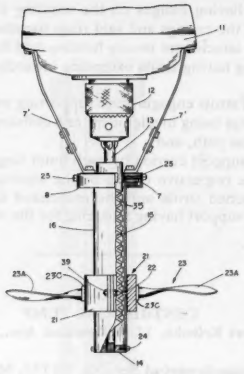
1. In a turbomachine having a turbine rotor with a plurality of radial blades, a first source of air at greater than atmospheric pressure and a second source of air at a pressure lower than that of the first air source: a turbine shroud ring surrounding the turbine rotor and having an inner wall adjacent the tips of the blades, the turbine shroud defining an annular coolant passage, the turbine shroud including a baffle effective to divide the coolant passage into an annular passage adjacent the inner wall and a pair of annular manifolds separated by the passage from the inner wall, each of the manifolds being separated from the other but open to the annular passage substantially around their circumference, the shroud ring further including an air inlet communicating the first air source to one of the manifolds and an air outlet diametrically opposite the air inlet communicating the other manifold with the second air source.

3,907,459
MIXING APPARATUS

Arthur R. Guedel, 5661 Laurel St., Indianapolis, Ind. 46227

Filed Aug. 19, 1974, Ser. No. 498,629
Int. Cl.[2] B01F 7/22
U.S. Cl. 416—65 7 Claims

1. Mixing apparatus comprising:
a. a double threaded member having a cam groove therein;
b. a slotted drive tube member encasing said double threaded member;
c. an impeller received on said slotted drive tube member;
d. a cam follower received in said cam groove engaging said impeller; and
e. means for rotating said slotted drive tube member relative to said double threaded member whereby said cam follower moves in said cam groove causing said impeller to

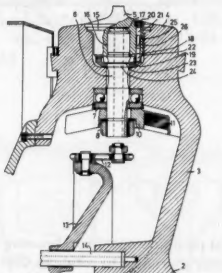


rotate about said slotted drive tube member and to reciprocate on said slotted drive tube member.

3,907,460
VANE WITH AN AXLE PIN FOR AXIAL IMPELLER WHEELS

Bendt Ove Pedersen, and Ole Jacobsen Bredsted, both of Naestved, Denmark, assignors to Nordisk Ventilator Co. A/S, Naestved, Denmark

Filed Jan. 22, 1974, Ser. No. 435,627
Claims priority, application Denmark, Jan. 22, 1973, 340/73
Int. Cl.[2] F04D 29/36
U.S. Cl. 416—168 1 Claim



1. In a vane mounting assembly for an axial flow fan having a plurality of vanes (5) rotatably mounted in a hub rim (4) of an impeller wheel, each vane being mounted in the hub rim by an axle pin (6) having a threaded portion (16) engaging a correspondingly threaded portion in a bore in a root portion (15) of each vane, and including means (9, 12, 13) connected to each axle pin for simultaneously rotating all of the vanes about the axes of the axle pins, the improvements characterized by:
a. a first portion (17) of the axle pin between the threaded portion and the nearest end of the axle pin having a diameter less than the inside diameter of the threaded portion,

b. a second portion (18) of the axle pin between the threaded portion and the farthest end of the axle pin having a diameter greater than the outside diameter of the threaded portion,

c. the bore in the root portion of each vane including an inner portion having a diameter generally corresponding to and for receiving said first portion of the axle pin and an outer portion having a diameter generally corresponding to and for receiving said second portion of the axle pin,

d. a fixing ring (19) rigidly mounted on the axle pin beneath the bottom of the root portion of the vane when the axle pin is threaded thereinto, said ring extending outwardly from the axle pin and having an aperture therethrough, and

e. a locking screw (20) threaded into and extending through a bore in the root portion of the vane, an end (22) of said screw extending into the aperture in the fixing ring, whereby the first and second portions of the axle pin absorb radial forces during the operation of the fan, the threaded portion absorbs centrifugal forces, and the locking screw absorbs torsional forces.

3,907,461

HAND AIR PUMPS

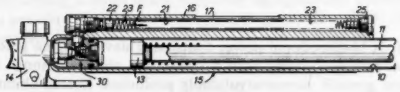
Paul C. Bouder, Soisy sous Montmorency, France, assignor to Etablissements Poutrait-Morin Societe Anonyme, Aubervilliers, France

Filed Apr. 22, 1974, Ser. No. 462,729

Claims priority, application France, Apr. 20, 1973, 73.14566

Int. Cl.[2] F04B *21/00*; **G01L** *19/06*; **F16K** *15/20, 37/00*

U.S. Cl. 417—63 **14 Claims**



11. A hand air pump comprising an elongated pump body, said pump body defining a compression chamber and a manometric pressure measuring chamber, said compression chamber including a delivery end, a piston displaceable in said compression chamber for moving air toward said delivery end during the displacement of said piston toward said delivery end, a non-return valve assembly disposed in said compression chamber at said delivery end, said valve assembly including a sleeve having an axial bore, said axial bore is in part defining a valve chamber, a valve body in said valve chamber normally closing communication between said compression chamber and an outlet end of said bore adapted for fluid communication with an object to be inflated, passage means continuously and uninterruptedly placing the valve chamber in fluid communication with said manometric pressure measuring chamber, said passage means is defined by another sleeve disposed transversely to said first mentioned sleeve, a piston in said manometric pressure measuring chamber, means biasing said piston toward said delivery end, and means for converting the displacement of said manometric measuring chamber piston away from said delivery end into an indication of the pressure within an inflated object.

3,907,462

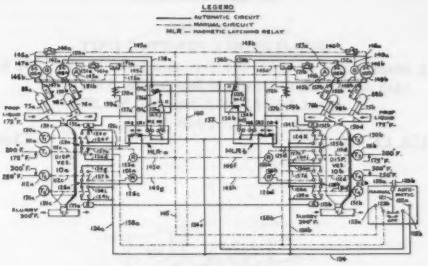
HYDRAULIC DISPLACEMENT TYPE PUMPING SYSTEM

Henry H. Kroeger, Montclair, N.J., assignor to Worthington Pump International Inc., Mountainside, N.J.

Continuation-in-part of Ser. No. 302,874, Nov. 1, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,322

Int. Cl.[2] F04F *11/00*; **F04B** *15/02*

U.S. Cl. 417—102 **14 Claims**



1. In a system for hydraulically displacing slurry with a direct contact propulsion liquid,

a. a plurality of displacement vessels each respectively forming a displacement chamber,

b. each of said displacement vessels having a lower opening for charging and discharging slurry into and out of the displacement chamber and an upper opening for charging and discharging a propulsion liquid into and out of the displacement chamber,

c. a first open transport system having storate means for slurry, means connecting said slurry storage means into the lower opening of each respective displacement vessel for delivering slurry therefrom to the displacement chamber of any given displacement vessel including, inlet check valve means, for each displacement vessel and means connected to the lower opening of each displacement vessel independent of the slurry delivering means for each given displacement vessel including, discharge check valve means for each displacement vessel to permit slurry to be discharged from the displacement chamber of each given displacement vessel to any suitable point of use,

d. a second open transport system having storage means for propulsion liquid, means connecting said propulsion liquid storage means to the upper opening of each respective displacement vessel for delivering propulsion liquid therefrom to the displacement chamber of any given displacement vessel including, normally closed inlet valve means for each displacement vessel for controlling charging of propulsion liquid to each displacement chamber of a given displacement vessel, and means connected to the upper opening of each displacement vessel independent of the propulsion liquid delivery means for each given displacement vessel including, normally closed outlet valve means to control return of propulsion liquid to the propulsion liquid storage means, and a high speed centrifugal pump,

e. an upper sensing means and a lower sensing means on each respective displacement vessel to sense the position of the interface between the slurry and propulsion liquid in the associated displacement chamber formed by the displacement vessel as the same are alternately and sequentially charged into and discharged from the given discharge chambers,

f. control means for operating the inlet valve means and the outlet valve means of said second open transport system operatively connected to the respective upper sensing means and lower sensing means to alternately and sequentially charge and return propulsion liquid into and out of each displacement chamber to pump slurry from

the respective displacement chambers to any suitable use, and

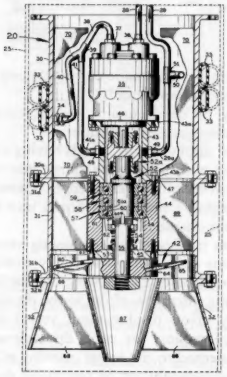
g. means in said control means to delay operation of the inlet valve means on each respective displacement vessel until any other associated displacement vessel has the slurry therein substantially discharged from the displacement chamber of such other associated displacement vessel.

3,907,463

SUBMERSIBLE PUMPING UNIT

J. Marlin Eller, 204 N.E. 8th Ter., and J. David Eller, 281 S.E. 18th Ave., both of Deerfield Beach, Fla. 33441

Filed July 5, 1973, Ser. No. 376,883
Int. Cl.² F04B *17/00*
U.S. Cl. 417—360 **6 Claims**



1. In a submersible pumping unit having a hydraulic motor driving a pump, and an annular casing extending circumferentially around the motor and pump, the improvement which comprises:

inflatable, radially expandable diaphragm means extending circumferentially around the outside of said casing;

and means for passing hydraulic liquid from the hydraulic output side of said motor into said diaphragm means to inflate the latter so as to expand radially outward for sealing engagement with a well casing which receives said motor, pump and casing.

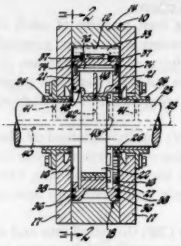
3,907,464

ROTARY ENGINE ROTOR

Boris J. Mitchell, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,347
Int. Cl.² F02B *53/00*
U.S. Cl. 418—61 A **2 Claims**

1. A cast hollow multi-lobe rotor for a rotary engine having a multi-apex peripheral wall with radially extending side walls, said peripheral wall joined by a radially extending central rib to a center hub, said cast rotor made with an expendable core which leaves aligned openings in said side walls and said rib radially inward of each said apex, said side walls in their outboard sides having a recess around each said opening, a cover mounted in each said recess for closing the associated opening, the covers in aligned openings being in alignment and having aligned rivet holes, and a rivet extending through the aligned rivet holes in each pair of aligned covers and also extending with substantial clearance through the associated opening in said rib for securing the covers to said rotor to close the core openings while leaving an internal oil passage about said rivet between the opposite sides of said rib.

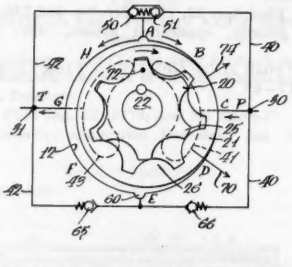


3,907,465

HYDRAULIC POWER TRANSLATING DEVICE

Donald R. Dorff, Union Grove, and Joseph A. Santi, Racine, both of Wis., assignors to Hydraulic Products Incorporated, Sturtevant, Wis.

Filed Aug. 29, 1974, Ser. No. 502,109
Int. Cl.² F04C *15/00*
U.S. Cl. 418—71 **9 Claims**



1. A bi-directional power translating device of the gerotor type having a casing with a cylindrical chamber, inner and outer gerotor elements rotatably positioned in said chamber with a clearance space between the chamber wall and the outer periphery of the outer gerotor element, a pair of casing ports connectable to pressure and tank respectively, passage means in said casing interconnecting said casing ports and including flow passages to fluid ports associated with the gerotor elements, means for delivering a flow of fluid to said clearance space in either direction of operation including a fluid inlet to said clearance space and generally in line with a line through the axis of rotation of the inner gerotor element and the pivot axis of the outer gerotor element, a fluid outlet from the clearance space through which fluid passes and which is diametrically opposed to said fluid inlet, each of said fluid inlet and outlet being connected to said passage means, and means to connect the fluid inlet to whichever of the casing ports that receives pressure fluid and the fluid outlet to the other casing port.

3,907,466

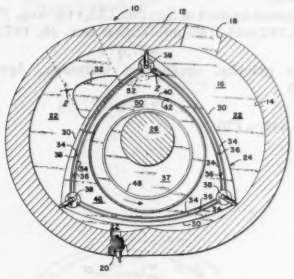
ROTARY COMBUSTION ENGINE OIL SEAL

Raymond P. Canale, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,642
Int. Cl.² F01C *19/08*
U.S. Cl. 418—75 **3 Claims**

1. A rotary engine having a relatively constant pressure drop across a rotor side face mounted oil seal assembly com-

prising a housing with an inwardly facing peripheral wall and oppositely facing inner end walls cooperatively defining a cavity, a crankshaft rotatably supported in said housing, said crankshaft having an eccentric located in said cavity, a rotor rotatably mounted on said eccentric, said rotor having side faces facing said side walls and peripheral faces facing said peripheral wall defining a plurality of chambers spaced about and moving with said rotor while varying in volume as said rotor rotates, a single annular oil seal groove in each side face of said rotor with its center on the rotor axis, an oil seal assembly positioned in each of said annular grooves and being biased into continual engagement with respective said housing end walls, gas seal grooves formed adjacent the periphery of



said rotor, gas seal assemblies mounted in each of said gas seal grooves and being continually biased into engagement with respective said housing end walls, said gas seals and said annular oil seal cooperatively defining a cavity therebetween on said rotor side faces, the improvement comprising; an intake port being provided in said housing with a predetermined portion of said intake port being in continuous fluid connection with said cavity defined between said gas seals and said oil seal such that the radially outward side of said oil seal assembly is constantly subjected to intake pressure thereby continually maintaining a pressure drop across said oil seal preventing it from being subjected to significant fluctuations in pressure drop thereacross permitting use of a single oil seal assembly.

3,907,467

ROTARY VANE MACHINE WITH FLUID FLOW PATHS ON EACH VANE SIDE

Ulf Christer Ekenberg; Johan Paul Strom, and Ragnar Georg Jonsson, all of Jakobsberg, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

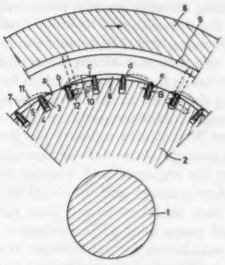
Continuation of Ser. No. 305,297, Nov. 10, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,534

Claims priority, application Sweden, Nov. 12, 1971, 14491/71

Int. Cl.[2] F01C *1/00;* **F03C** *3/00;* **F04C** *1/00;* **F01C** *21/00*

U.S. Cl. 418—82 **4 Claims**

1. A reversible direction hydraulic machine comprising a stator and a rotor, said stator having a cam profile defining work chambers, said rotor connected to a shaft and enclosed within said stator, said rotor having a plurality of radially extending symmetrical slots spaced thereabout and a respective pressure chamber located radially inward from each slot and communicating therewith, said rotor also comprising a radially displaceable vane carried in each of said slots, each vane being symmetrical with respect to a radial plane and having two narrow sides transverse to said plane and two broad sides, a portion of said vane protruding from said slot for contact with said cam profile so as to prevent a working medium from flowing between an outer edge of said vane and said cam profile from a high pressure side of the vane to a low pressure side, said rotor having at least one flow path means symmetrically arranged about each broad side of each vane for permitting said working medium to flow between the work chamber and the respective pressure chamber, each vane having a thickness slightly less than the width of the respective slot, said flow path means being in addition to space between said vane and said slot due to said lesser thickness of the vane— has been inserted after the comma. said slot having a depth and said vane having a total radial length such that the broad side of said vane on the low pressure side is brought into



area contact with a corresponding side of said slot without tilting of said vane, whereby a total flow path between the work chamber and the pressure chamber on the high pressure side of said vane has a flow resistance less than that on the low pressure side of said vane, and upon reversal of the machine the opposite broad side of said vane will become the low pressure side and be in area contact with a corresponding side of the slot.

3,907,468

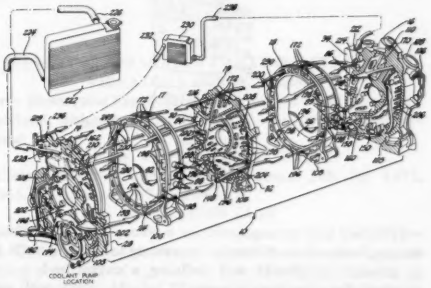
ROTARY ENGINE COOLING SYSTEM

Raymond J. Green, Northville, and Erkki A. Koivunen, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 22, 1974, Ser. No. 472,429

Int. Cl.[2] F04C *29/04;* **F01P** *7/16*

U.S. Cl. 418—83 **3 Claims**



1. A rotary combustion engine having at least one rotor housing and a pair of end housings, a coolant pump having an inlet and an outlet in one of said end housings, said housings having a first pass coolant passage connected to said pump inlet in said one end housing and extending axially through said rotor housing in an intermediate heat region thereof where working chamber exhaust occurs and terminating in the other of said end housings, said housings further having a second pass coolant passage connected to said first pass coolant passage in said other end housing and extending axially through said rotor housing in the hotest heat region thereof where working chamber combustion occurs and terminating in said one end housing, said housings further having a bypass coolant passage originating at one end in said other end housing and extending axially through said rotor housing in the coolest region thereof where working chamber intake occurs

and connected at the opposite end to said pump inlet in said one end housing, a radiator having an inlet connected to said second pass coolant passage at said one end housing and having an outlet connected to said pump inlet at said one end housing, a heater having an inlet connected to said second pass coolant passage at said one end housing and having an outlet connected to said bypass coolant passage at said other end housing, said one end housing and said rotor housing having a heater bypass passage connected at one end in said one end housing to said second pass coolant passage and connected at the opposite end to said bypass coolant passage in said rotor housing and thus to said pump inlet in said one end housing, and thermostatically controlled valve means in said one end housing for blocking coolant flow to said radiator and permitting fluid flow to said heater bypass passage below a predetermined coolant temperature and, alternatively, permitting coolant flow to said radiator and limiting flow to said heater bypass passage above said predetermined temperature whereby when the engine is cool, coolant passes through said first pass coolant passage and then said second pass coolant passage and then said heater and then said bypass coolant passage to said pump inlet while coolant is also permitted to pass through said heater bypass passage to said pump inlet in parallel with coolant flow to said heater to prevent excessive pressures in said heater and when the engine has sufficiently warmed up, coolant passes first through said first pass coolant passage and then said second pass coolant passage and then said radiator to said pump inlet while coolant continues to flow through said heater and then through said bypass coolant passage to said pump inlet.

3,907,469

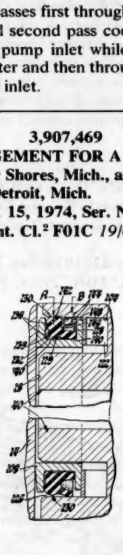
OIL SEAL ARRANGEMENT FOR A ROTARY MACHINE

Laszlo Nagy, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 15, 1974, Ser. No. 451,486

Int. Cl.² F01C *19/08*

U.S. Cl. 418—142 **4 Claims**



1. An oil seal arrangement for a rotary machine having a housing with a pair of interior oppositely facing end walls and an interior peripheral wall defining a cavity and a rotor mounted for planetary movement in said cavity with sides opposite said end walls, said oil seal arrangement comprising an annular oil seal groove in each side of said rotor, an annular oil scraper seal mounted in each said oil seal groove for scraping the opposite end wall while said rotor planetates, a spring mounted in each said oil seal groove for biasing the oil scraper seal axially outward against the opposite end wall, a radially facing sealing ring groove in each said oil scraper seal, elastomeric sealing ring means mounted in each said sealing ring groove, each said elastomeric sealing ring means having a main load carrier portion radially squeezed between said oil scraper seal and said rotor, each said elastomeric sealing ring means further having a continuous annular lip depending in both an axial and radial direction from said load carrier portion to engage said rotor and be deflected thereby and said lip having a radial deflection on installation substantially greater than the radial squeeze of said load carrier portion but a spring rate substantially less than that of said load carrier portion so that said load carrier portion provides a continuous elastic support for said oil scraper seal in all relative positions thereof without direct contact between said oil scraper seal and said rotor while said lip flexes sufficiently to maintain sealing contact in all relative positions of said oil scraper seal.

3,907,470

GEAR MACHINE

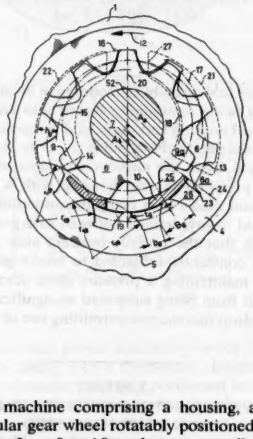
Hermann Harle; Siegfried Eisenmann, both of Aulendorf, and Kurt Sickinger, Sigmaringen, all of Germany, assignors to Furstlich Hohenzollernsche Huttenverwaltung Laucherthal, Germany

Continuation-in-part of Ser. No. 173,110, Aug. 19, 1971, Pat. No. 3,782,040. This application Dec. 26, 1973, Ser. No. 427,671

Claims priority, application Germany, Apr. 13, 1973, 2318753

Int. Cl.² F04C *1/06*

U.S. Cl. 418—170 **28 Claims**



1. A gear machine comprising a housing, an internally-toothed, annular gear wheel rotatably positioned in said housing and having from 9 to 15 teeth, an externally-toothed pinion adapted to mesh with said annular gear wheel and having two teeth less than said annular gear wheel, the diameter of the addendum circle of said annular gear wheel being smaller than the diameter of the addendum circle of said pinion, and a generally crescent-shaped filler piece radially filled and extending over a predominant portion of the length of the free space between the addendum circle surface of said pinion and the addendum circle surface of said annular gear wheel on the side of said machine opposite the point of deepest tooth mesh of said pinion and said annular gear wheel, said filler piece having one cylindrical surface, on the annular gear wheel side thereof, defined by said addendum circle surface of said annular gear wheel and its other cylindrical surface, on the pinion side thereof, defined by said addendum circle surface of said pinion; whereby said addendum surfaces of said annular gear wheel and said pinion sealably glide along said cylindrical surfaces of said filler piece, respectively, and at least the end of said filler piece which is pointing in the direction of rotation is shortened and terminates substantially at a position at which the trailing end of said addendum surface of one tooth of said annular gear wheel and the trailing end of said addendum surface of one tooth of said pinion simultaneously come out of contact with the corresponding cylindrical surfaces of said filler piece.

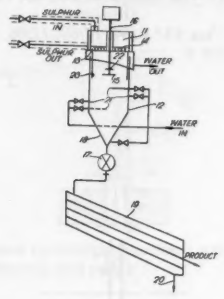
3,907,471
SWIRLING WATER VESSEL FOR FORMING SULFUR PELLETS

Herbert James Elliott, The Bungalow, Bradford-on-Avon, England

Continuation of Ser. No. 820,348, March 17, 1969, abandoned, which is a continuation of Ser. No. 488,039, Sept. 17, 1965, abandoned. This application Oct. 24, 1972, Ser. No. 299,863

Int. Cl. B22d *23/08*

U.S. Cl. 425—6 **8 Claims**



1. An apparatus for continuously forming discrete sulphur pellets comprising, in combination:

a columnar vessel with a coned bottom portion adapted to operate at atmospheric pressure and filled to a predetermined level with water;

a static reservoir for molten sulphur at the head of said vessel and spaced a short distance above said water level; a plurality of apertures disposed in the floor of the reservoir, said apertures being adapted to deliver molten sulphur from the reservoir in separate downward streams that fall substantially vertically into the water in said vessel;

means provided in association with said vessel to create a continuous swirling motion of said water sufficient to cause sulphur droplets to follow a more or less spiral path through said vessel; and

a trap valve for removal of pellets collected in said coned bottom portion.

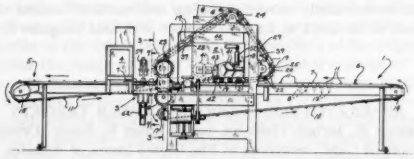
3,907,472
MACHINE FOR MAKING SNOW CONES

Thomas H. Lutsey, P.O. Box 3157, Green Bay, Wis. 54303

Filed Sept. 5, 1973, Ser. No. 394,534

Int. Cl.² A23G *9/22*

U.S. Cl. 425—127 **21 Claims**



1. A machine for making snow cones supplied in successive trays of transverse tiers, comprising a loading zone, a filling zone having bulk feeding means with individual riser producing cavity means, a riser forming zone, a flavoring zone and an unloading zone; a straight line conveyor intermittently moving successive trays of cones from said loading zone to said unloading zone through said filling, forming and flavoring zones, and means moving said cavity means in alignment with corresponding cones in said filling zone.

3,907,473
CONTINUOUS PRESSES

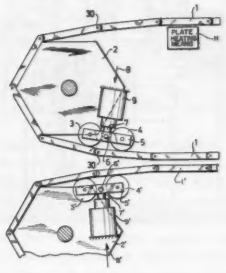
Albert de Mets, Kachtem, Izegem, Belgium, assignor to Bisonwerke Bahre and Greten GmbH and Co. KG, Germany

Filed Apr. 6, 1973, Ser. No. 348,603

Claims priority, application Germany, Apr. 7, 1972, 2216782; Mar. 19, 1973, 2313556

Int. Cl.² B29C *3/06*

U.S. Cl. 425—141 **12 Claims**



1. A continuous press for use in the production of chipboard, fibreboard or the like, including upper and lower cooperating pressing assemblies each comprising an endless belt carried by an endless conveyor in the form of a series of articulated plates guided by polygonal rollers, at least one pressure applying means mounted internally of each of said endless conveyors adjacent the press inlet and arranged to press outwardly on the plates of said conveyors in operation, and control means for adjusting the pressure applied by said pressure applying means.

3,907,474
COMPACTING APPARATUS INCLUDING STEADY AND VIBRATORY FORCE MEANS

Harry Blaser, and Franz Stelzmuller, both of Oensingen, Switzerland, assignors to Von Roll A.G., Gerlafingen, Switzerland

Filed July 19, 1973, Ser. No. 380,538

Claims priority, application Switzerland, July 20, 1972, 10866/72; Aug. 18, 1972, 12276/72

Int. Cl.² B30B *11/14*

U.S. Cl. 425—149 **18 Claims**

1. Compacting apparatus to manufacture blocks by compacting a mixture of a granulate and a binder, comprising

a compacting cylinder (**2**) in which the granulate to be compacted is placed;

bottom and top pistons (**3, 4**) closing said cylinder and movable to compact granulate within the cylinder;

a piston support means (**62**) connected to and supporting at least one of the pistons (**3, 4**);

means (**6, 7, 12**) moving at least one piston (**3, 4**) in compaction direction, comprising

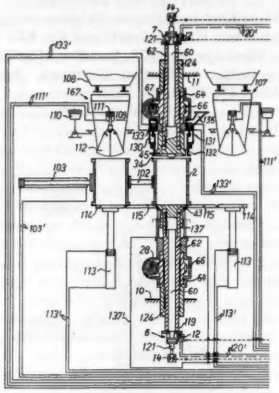
a spindle drive, the support means (**62**) forming the spindle element of the spindle drive and a spindle nut (**64**) forming the nut element of the spindle drive;

a housing (**124**) for the spindle drive, and means (**10, 11**) supporting the housing, the spindle element (**62**) being journalled in the housing and the spindle nut elements (**64, 129**) being supported in the housing;

and motor means (**70**) in rotating engagement with one of the elements of the spindle drive (**20**);

wherein the piston support means comprises a piston guide rod (**60**) connected to each of the pistons (**3, 4**);

a sleeve (**62**) surrounding each of the piston guide rods (60), the sleeve forming said spindle element;



and wherein separate force means (**12**) are provided, secured to the sleeve (**62**) and to the piston guide rod (**60**) respectively, to impart a force to the piston guide rod (60) and hence to the pistons (**3, 4**) with respect to the sleeve.

3,907,475

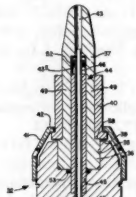
APPARATUS FOR BLOW MOLDING CONTAINERS

Kenneth E. Bowers, Prairie Village, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.

Division of Ser. No. 209,167, Dec. 17, 1971, Pat. No. 3,796,531. This application Aug. 20, 1973, Ser. No. 389,695

Int. Cl.² B29C *24/00*

U.S. Cl. 425—302 B **8 Claims**



1. A blow pin assembly for use in a blow molding apparatus, said assembly comprising:

a. a body member having an axial bore extending at least part way through said body and an axial counterbore at one end of said body;

b. a separate blow tip having an axial bore therethrough communicating with said bore in said body member;

c. a separate generally cylindrical cutter ring slidably receivable over said blow tip and seated on its base and on an annular shoulder provided on said base of said blow tip; and

d. a collar member having one end removably connected to said body member and its other end coupled to said cutter ring whereby said blow tip is fixedly seated to said body.

3,907,476

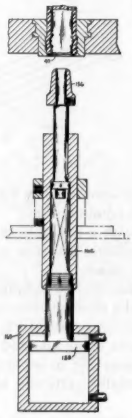
APPARATUS FOR FINISHING HOLLOW PLASTIC ARTICLES

Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 120,514, March 3, 1971, Pat. No. 3,736,091. This application Dec. 26, 1972, Ser. No. 318,460

Int. Cl.² B29C *17/00, 17/08*

U.S. Cl. 425—305 B **11 Claims**



1. In apparatus for finishing a hollow plastic article having a neck with an integrally attached waste portion which includes means for holding the article around the neck, means for severing the waste portion from the neck, a finishing tool for cooperating with an irregular lip left after severance in the area of the prior junction of the neck with the waste portion, the improvement which comprises means for moving at least a surface portion of said finishing tool eccentrically with respect to the axis of the neck to bring said surface portion into forcible contact with the irregular lip and means for rolling said eccentrically moved finishing tool surface around the inside of the neck in forcible contact with said irregular lip.

3,907,477

APPARATUS FOR PRODUCING LASER TARGETS

Thomas R. Jarboe, Oakland, and William R. Baker, Orinda, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

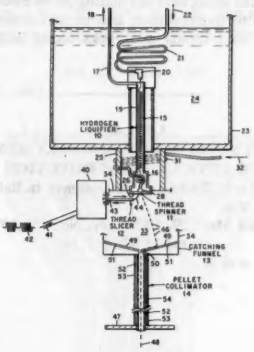
Filed Feb. 26, 1974, Ser. No. 446,066

Int. Cl.² B29C *17/14;* **B21C** *29/00*

U.S. Cl. 425—308 **5 Claims**

1. An apparatus for producing laser targets of deuterium having a diameter in the range of 25 to 75μ comprising: means for precooling deuterium, means for forming a stable thread

of the thus cooled deuterium, means for slicing said stable thread into pellets of selected length, means for collecting said



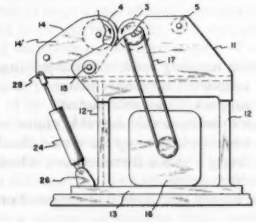
pellets, and means operatively associated with said collecting means for collimating said pellets.

3,907,478

PRODUCTION OF POLYMER FIBERS

Brian J. Vernon, Timperley, and Wladyslaw H. Skoroszewski, Manchester, both of England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 814,768, April 9, 1969, Pat. No. 3,672,013. This application Jan. 20, 1972, Ser. No. 219,407
Claims priority, application United Kingdom, Apr. 10, 1968, 17237/68
Int. Cl.[2] B29D *7/22*
U.S. Cl. 425—367 **1 Claim**



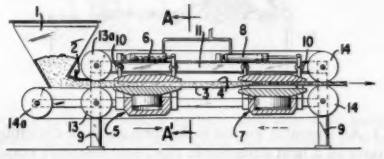
1. A web-profiling unit suitable for use in the manufacture of synthetic fibers which comprises a ridged roller having a plurality of closely-spaced, parallel, surface ridges each having inwardly directed sides leading to a peak which is slightly radiused, the sides of adjacent ridges forming troughs, the profile of the ridges being such that the pitch of the ridges is within the range 0.003 to 0.05 inches and the depth of the troughs between adjacent ridges is within the range 0.002 to 0.02 inches mounted in a fixed frame and adapted to be rotationally driven and a plain roller mounted in a movable frame which is pivotally attached to said fixed frame for movement with respect thereto by the biasing means, said movable frame being formed from two opposed side members each carrying a bearing for one end of said plain roller, and a pair of piston and cylinder mechanisms acting respectively on said side members, said side members being connected by a torsion bar fixed to one side member but fitting with clearance in a hole in the other side member, said rollers having non-yielding surfaces.

3,907,479

DEVICE FOR THE COMPRESSION OF BLACK POWDER

Friedrich Platte, Essen, and Wolfgang Wiedemann, Dulmen, both of Germany, assignors to Wasagchemie GmbH, Munich, Germany

Division of Ser. No. 274,493, July 24, 1972. This application June 26, 1974, Ser. No. 483,143
Claims priority, application Germany, Aug. 3, 1971, 2138724
Int. Cl. B29c *3/00;* **B29j** *1/00;* **B30b** *5/04*
U.S. Cl. 425—371 **5 Claims**



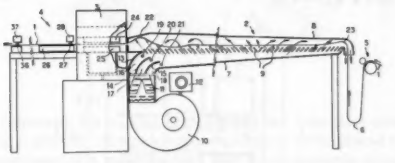
1. An apparatus for continuous production of compressed black powder comprising means for feeding black powder onto a lower endless belt and in between said lower belt and an upper endless belt provided with compressible sealing means on the outer edges thereof, a means for precompressing the black powder between the two endless belts, a laterally moveable, primary compression means for initially compressing the black powder while laterally moving the same, a laterally moveable, final compression means for compressing the black powder while moving the same, and discharge means for recovering the compressed black powder.

3,907,480

APPARATUS FOR PROCESSING THIN PLASTICS FILM

Robert A. Renoux, 80 Avenue Lefebvre, Les Cles de la Foret, 78300 Poissy, France

Filed Jan. 7, 1974, Ser. No. 431,490
Claims priority, application France, Jan. 8, 1973, 73.00506
Int. Cl.[2] B29C *17/00*
U.S. Cl. 425—385 **4 Claims**

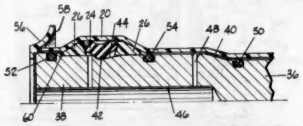


1. Apparatus for processing thin plastics films for use in particular in the manufacture of flexible gramophone records, which apparatus is of the type that comprises an oven for the thermal preparation of the film, a moulding press and a mechanical means for the stepwise advancement of the film, these units being disposed in that order along the path of travel of the film, wherein the oven is constituted by an elongate enclosure in the form of a tunnel which is connected to a regulated hot-air supply source and which is provided with horizontal parallel deflectors arranged transversely along its entire length, the deflectors being divided into two zones, the deflectors in one of these zones being inclined in a direction opposite to that in which the deflectors in the other zone are inclined and the deflectors sloping upwards towards the respective ends of the enclosure, the arrangement being such as to ensure that the film is supported on a cushion of air and at the same time a feed loop is formed at each of the two ends of the enclosure.

3,907,481
ASSEMBLY FOR FORMING THE BELL END OF A BELL AND SPIGOT JOINT

Robert Walter Heisler, Somerville, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 240,080, March 31, 1972, Pat. No. 3,807,027. This application Sept. 24, 1973, Ser. No. 400,488
Int. Cl.[2] B29D *23/00*; B29C *17/00*
U.S. Cl. 425—393 16 Claims

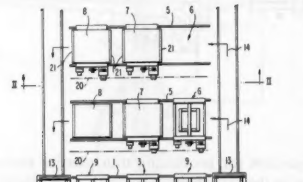


1. An assembly for use in forming an inner-circumferential groove in a heat deformable pipe, said assembly comprising:
a. an elongated cylindrical mandrel adapted for insertion concentrically within one end of a heat deformable pipe by relative movement between the mandrel and pipe;
b. said mandrel including about its outer periphery a circumferential recess;
c. a circumferential sealing gasket, a circumferential portion of which is located within said recess and a circumferential portion of which is located outside said recess;
d. an annular ramped surface comprising one circumferential side of said recess and tapering radially outwardly and away from the other side of said recess; and
e. means for guiding said one end of said pipe outwardly of said gasket as said end approaches said gasket during said relative movement.

3,907,482
ROTATIONAL MOLDING APPARATUS

Akihiro Shiota, Hirakata; Atsuo Okabe, Asaka, and Hideo Okada, Hirakata, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 2, 1974, Ser. No. 430,125
Claims priority, application Japan, Dec. 29, 1972, 48-3602
Int. Cl.[2] B29C *5/04*
U.S. Cl. 425—435 7 Claims

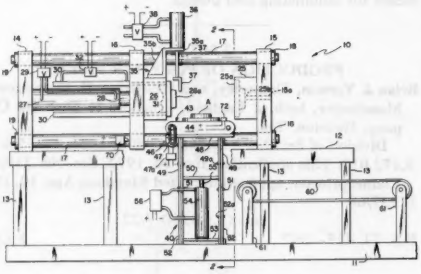


1. A synthetic resin molding apparatus comprising a first guide track extended between a molded article withdrawal station and a material feeding station, a plurality of second guide tracks arranged substantially in parallel relation with said first guide track and respectively passing through heating furnaces and cooling chambers, and third guide tracks provided on the both sides of said first and second guide tracks mounted with carriages capable of reciprocating in the direction substantially perpendicular to said first and second guide tracks and having rack carrying tracks capable of joining said first and second guide tracks, aforesaid tracks forming together a plurality of circulating paths consisting of the material feeding station, the heating furnace, the cooling chamber, and the molded article withdrawal station arranged successively while utilizing said material feeding station and said molded article withdrawal station in common, and a plurality of racks having drive means thereon for rotating the mold and moving the racks along said circulating paths through a plurality of stations to thereby melt and mold the synthetic resin while moving said molds and racks along said circulating paths.

3,907,483
APPARATUS FOR AUTOMATICALLY REMOVING FINISHED ARTICLE FROM INJECTION MOLD

Raymond A. York, Rockford, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 29, 1974, Ser. No. 456,297
Int. Cl.[2] B29F *1/14*
U.S. Cl. 425—436 R 14 Claims



1. An injection molding apparatus comprising:
a vertically supported stationary platen,
a vertically supported movable platen,
power means to activate said movable platen in a horizontal direction towards and away from said fixed platen, said platen defining a space therebetween when said platens are in an open position,
mating mold halves, one mold half mounted on each of said platens,
said mold halves defining a space therebetween when said platens are in an open position,
a base portion of said apparatus defining an open space therein, at least a portion of said space being directly below said space defined by said open platens,
means for receiving a finished article from said apparatus and conveying said article away from said mold halves, said means for receiving and conveying disposed within the base portion below the mold halves and including an upwardly facing receiving surface,
an operating means disposed within said space in the base portion.
said operating means including means attached to said receiving and conveying means for lifting it solely in a vertical direction to move said receiving means upwardly into the space defined by said open platens for receiving an article formed in said apparatus, and operable to move said receiving and conveying means downwardly out of said space to permit reclosing of the mold halves for a subsequent molding cycle.

3,907,484
DIE HEAD FOR AN EXTRUDER

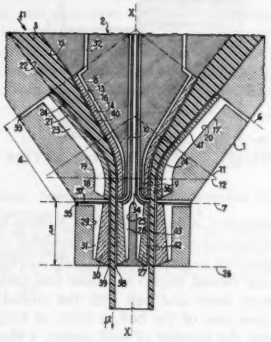
Pierre Claude Marcel Delorme, and Yves Fournier, both of Chalon-sur-Saone, France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Nov. 27, 1972, Ser. No. 309,849

Claims priority, application France, Nov. 29, 1971, 71.42631

Int. Cl.² B29F *3/04*

U.S. Cl. 425—467 **1 Claim**



1. A die head for an extruder, the die head comprising means defining a body having an inlet and an outlet for the extruded material, means defining an axial mandrel inside said body for the extrusion of a hollow product, wall means comprising an inner portion which is carried by the mandrel an an outer portion carried by the die head body, said inner portion of said wall means having an outer surface and having a section which decreases in a direction from said inlet to said outlet and said outer portion of said wall means having an inner surface, said inner surface and outer surface defining an annular passage for the flow under pressure of the material being extruded, at least a part of said inner portion and at least a part of said outer portion being of a material pervious to gaseous fluid and defining at least a part of said outer and inner surfaces, the annular flow passage having a section which decreases progressively in the direction from the inlet to the outlet of the die head in at least a portion of said parts pervious to said gaseous fluid, means defining a plurality of separate first chambers surrounding said part of said outer portion which is of pervious material and respectively communicating with different portions of said part of pervious material, each of said chambers having a separate inlet for communication with a source of gaseous fluid, means defining a plurality of separate second chambers respectively surrounded by different portions of said part of said inner portion which is of pervious material, said second chambers respectively communicating with said different portions of said part of said inner portion and each of said second chambers having a separate inlet for communication with a source of gaseous fluid.

3,907,485
SEGMENTED BRIQUETTING ROLL STRUCTURE

Karl R. Komarek, Chicago, Ill., assignor to K. R. Komarek, Inc., Elk Grove Village, Ill.

Division of Ser. No. 338,272, March 5, 1973, Pat. No. 3,830,612. This application May 17, 1974, Ser. No. 470,811

Int. Cl.² B29C *1/00*

U.S. Cl. 425—470 **11 Claims**

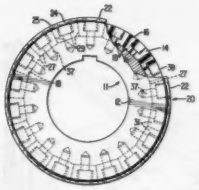
1. A mold segment for a briquetting roll, having

A. a top working surface of a hard, highly wear-resistant material;

B. an uninterrupted bottom surface opposite said top surface;

C. two opposite end walls connecting said top working surface and said bottom surface, said end walls diverging with respect to each other from said bottom surface; and

D. two opposite side walls connecting said top working



surface and said bottom surface, said side walls having means for detachably connecting said segments to a briquetting roll frame and for restraining said segments from moving relative to said frame during briquetting operations including projections extending outwardly from said side walls and at least one concave portion in said side wall to receive retaining means.

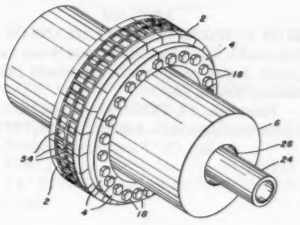
3,907,486
MEANS FOR INTERNALLY COOLING BRIQUETTING MACHINE ROLLS AND SEGMENTS

Frank Kennedy, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 422,641, Dec. 7, 1973, Pat. No. 3,873,259. This application Oct. 21, 1974, Ser. No. 516,557

Int. Cl.² B29C *3/02*

U.S. Cl. 425—471 **10 Claims**



1. Apparatus for making reduced iron ore briquettes comprising a plurality of mold segments adapted to be placed on the periphery of a mold support, said mold segments having transverse passages for conducting water through them, and a mold support in the form of a roll adapted to accommodate a plurality of mold segments around its periphery, said mold support also having transverse passages for cooling water, and manifold means for circulating cooling water from the mold support to the mold segments.

3,907,487
CANDLEWICK PREPARATION AND INSTALLATION APPARATUS

Wilfred L. Reiher, 4701 N. 55th St., Phoenix, Ariz. 85018

Filed May 23, 1974, Ser. No. 472,851

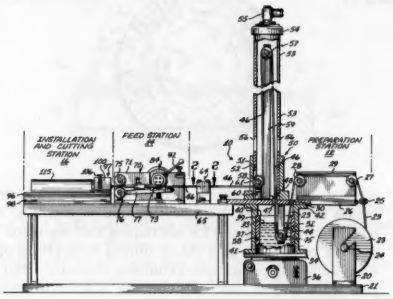
Int. Cl.² B29C *27/30*

U.S. Cl. 425—517 **15 Claims**

1. An apparatus for installing wicking in a candle body having an axial bore formed therein, said apparatus comprising:

a. a preparation station having an elongated strand of wicking;

b. a feed station for moving the strand of wicking from said preparation station to said feed station and passing the strand of wicking therethrough, said feed station including means for actuation thereof to move and a pass a measured amount of the strand of wicking upon actuation thereof; and



c. an installation and cutting station for sequentially receiving and severing the measured amount of the strand of wicking supplied thereto by said feed station, said installation and cutting station having means upon which the candle body is demountably positionable so that the axial bore thereof is disposed to receive the measured amount of the strand of wicking prior to the severing thereof when the candle body is mounted therein.

3,907,488

METHOD OF BURNING FUELS BY MEANS OF A BURNER

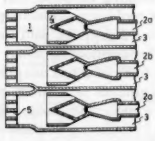
Yasuro Takahashi; Yukihisa Fujima, and Hisao Yamamoto, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,679

Claims priority, application Japan, Feb. 24, 1973, 48-22339

Int. Cl.² F23C *11/00*

U.S. Cl. 431—2 **9 Claims**



1. A method of burning a fuel by means of a burner which comprises premixing the fuel with air in an amount larger than the quantity theoretically required for the combustion of the fuel, allowing the resulting lean premixture to be issued from some of plural nozzles of the burner, while at the same time, premixing the fuel with air in an amount less than the theoretically required quantity, allowing the resulting rich premixture to be issued from the remaining nozzles, and burning the two gaseous premixtures together wherein the two gaseous premixtures are separately mixed with an inert liquid by spraying before they are issued from the respective burner nozzles for combustion.

3,907,489

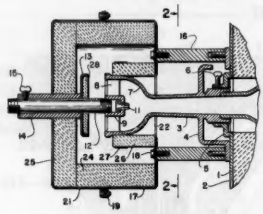
NOISE SUPPRESSOR FOR BURNER

Harry C. Santisi, Dresher, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Oct. 3, 1974, Ser. No. 511,938

Int. Cl.² F23C *7/04*

U.S. Cl. 431—114 **3 Claims**



1. In combination, a burner having a portion adapted to be inserted in a furnace wall and being provided with a venturi having an open bell spaced from said wall, a cylindrical casing having one end closed, means to mount said casing surrounding and spaced from said bell with the closed end thereof facing the open end of the bell, a layer of sound absorbing material lining the interior of said casing, a sleeve of sound absorbing material mounted on and surrounding said bell, the exterior of the sleeve and the interior of the casing lining forming an annular passage for primary air to the burner, and means to discharge gas under pressure into said bell thereby to aspirate air through said annular passage.

3,907,490

PORTABLE PRESSURE GAS APPARATUS SUPERPOSED ON A VERTICAL AXIS-CONTAINER

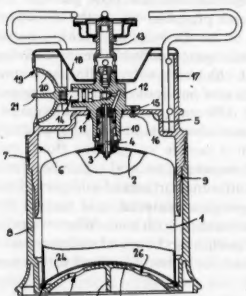
Pierre Andre Schaller, Lyon, France, assignor to Application des Gaz, Paris, France

Filed Nov. 23, 1973, Ser. No. 418,284

Claims priority, application France, Nov. 28, 1972, 72.42964

Int. Cl.² F23Q *2/00*

U.S. Cl. 431—142 **7 Claims**



1. Portable apparatus for cooking, lighting or heating using an inflammable gas in a container storing said gas in pressurized condition, the container being operatively disposed to cooperate with a superposed operating unit including a gas take-off head adapted to be connected gas-tight with the top of said container, and including above said head a burner, and the operating unit further including beneath the burner a control means for controlling gas delivery from the head to the burner; said apparatus further comprising a surrounding casing, integrally formed to provide upper and lower bell-shaped

portions disposed one above the other in back-to-back relationship about a common end wall through which said operating unit extends with the burner and the burner control means in the upper bell-shaped portion and with the gas take-off head in the lower bell-shaped portion, the operating unit being permanently fixed to said common wall, the lower downwardly open bell-shaped portion being shaped to receive the gas container; means cooperative with said lower bell-shaped portion to approach and maintain said container in gas-tight connected relation with said head, and the upper bell-shaped portion surrounding said unit and its gas delivery control means above said common wall and extending toward the level of the burner; and a metallic plate centrally mounted to extend beneath the burner and around said operating unit, and said plate extending outwardly to cover the casing as a barrier to protect it from the heat dispensed by the burner.

3,907,491

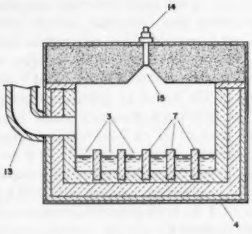
MOLTEN METAL SUPERHEATER AND METHOD OF USING THE SAME

David V. Morse, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 300,924, Oct. 26, 1972, abandoned. This application May 22, 1974, Ser. No. 472,394

Int. Cl.[2] F27D *17/00;* **F27B** *9/08, 14/00*

U.S. Cl. 432—28 **16 Claims**



1. A heat exchange unit for transmitting heat to molten metals which reflect radiant heat, said unit comprising highly heat conductive surfaces forming an elongated generally horizontally disposed channel for the flow of said molten metal, and means for radiantly heating said conductive surfaces to a temperature range above the temperature of said molten metal.

3,907,492

FUSING APPARATUS

Vaidevutis C. Draugelis; George N. Tsilibes, and John E. Vineski, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 300,531, Oct. 25, 1972, Pat. No. 3,826,892. This application Mar. 28, 1974, Ser. No. 455,694

Int. Cl.[2] H05B *1/00;* **F27B** *9/28*

U.S. Cl. 432—59 **8 Claims**

1. An apparatus for coalescing and affixing permanently a powder pattern to a sheet of support material, including:

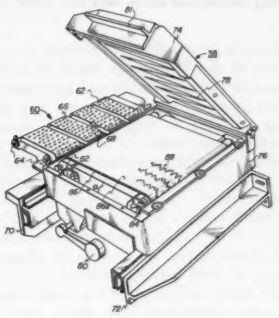
means for transporting the sheet of support material with the powder pattern deposited on one surface thereof along a path of movement, said transport means being arranged to be in substantial contact with the other surface of the sheet of support material;

means for heating said transport means;

a radiant energy source arranged to be in thermal communication with the sheet of support material for supplying the energy output thereof onto the sheet of support material being moved with the powder pattern thereon by said transport means along the path of movement coalescing and affixing substantially permanently the powder pattern to the sheet of support material;

first control means arranged to actuate said heating means in response to the apparatus being energized for rapidly heating and regulating said transport means at about a standby temperature; and

second control means arranged to actuate said radiant energy source, in response to the apparatus being energized, for rapidly heating said transport means to about



the standby temperature and deactuating said radiant energy source at about the standby temperature, said second control means, responsive to the sheet of support material being positioned on said transport means, for regulating said radiant energy source above a predetermined temperature at a lower power level and below the predetermined temperature at a higher power level.

3,907,493

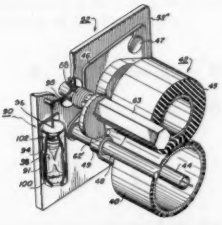
VISCO-ELASTIC DAMPENER MECHANISM FOR FUSER ASSEMBLY

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 11, 1974, Ser. No. 487,491

Int. Cl.[2] F27B *9/28;* **B21B** *27/06;* **G03G** *5/00*

U.S. Cl. 432—60 **3 Claims**



1. In a pressure roll fuser fusing apparatus adapted for use with copy producing machines, said fusing apparatus including cooperating first and second rollers adapted to form a nip through which copies being fused pass with one of said rollers being heated, the combination of:

means supporting said first roller for movement into and out of cooperative pressure relationship with said second roller;

drive means adapted when actuated to move said first roller into pressure relationship with said second roller;

bias means adapted when loaded and activated to move said first roller away from said second roller, said drive means serving when actuated to load said bias means;

means for locking said roller in pressure relationship with said bias means loaded and ready to move said first roller away;

means to release said locking means whereby to activate said bias means and move said first roller away;

visco-elastic dampener means including a supply of silicone putty operable on release of said locking means to cushion the load of said first roller under the influence of said bias means upon subsequent stopping of said first roller and movement away from said second roller,

said visco-elastic dampener means including a housing receiving a sliding disc member which is connected to a flexible cable wrapped around a shaft connected to said drive means, said housing containing said silicone putty which is in surface contact with said sliding disc member.

3,907,494

HAIR DYES BASED ON DIAMINO-NITRO-BENZENE COMPOUNDS

Ferdi Saygin, Dusseldorf, Germany, assignor to Therachemie Chemisch Therapeutische Gesellschaft m.b.H., Dusseldorf, Germany

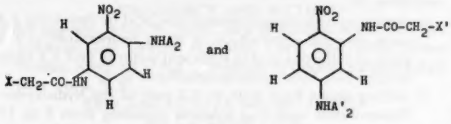
Division of Ser. No. 272,383, July 17, 1972, abandoned. This application Feb. 28, 1973, Ser. No. 336,696

Claims priority, application Germany, Oct. 4, 1971, 2149467; Feb. 18, 1972, 2207683

Int. Cl.[2] A61K *7/12, 7/13*; D06P *3/00, 5/00, 1/32, 3/06*

U.S. Cl. 8—10 12 Claims

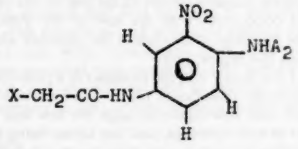
1. An aqueous preparation for the direct dyeing of human hair consisting essentially of (1) from 0.1% to 5% by weight of a diamino-nitrobenzene compound of the formula selected from the group consisting of



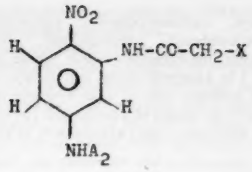
in which X and X′ are each an electrophilic substituent selected from the group consisting of cyano, alkanoyl of 2 to 10 carbon atoms, substituted alkanoyl of 2 to 10 carbon atoms with a substituent selected from the group consisting of nitro, phenyl, halo, cyano, carboxyl and sulfo, acyl of aromatic hydrocarbon carboxylic acids having 7 to 15 carbon atoms, substituted acyl of aromatic hydrocarbon carboxylic acids having from 7 to 15 carbon atoms with a substituent selected from the grop consisting of lower alkyl, nitro, halo, cyano, carboxyl and sulfo, cycloalkylcarbonyl of 6 to 10 carbon atoms, alkoxycarbonyl of 2 to 10 carbon atoms, cycloalkoxycarbonyl of 6 to 10 carbon atoms, phenylalkoxycarbonyl of 8 to 16 carbon atoms, furoyl, and thenoyl; and A'_2 is a member selected from the group consisting of hydrogen, alkyl of 1 to 10 carbon atoms, hydroxyalkyl of 1 to 10 carbon atoms, N,N-dialkyl-aminoalkyl of 3 to 18 carbon atoms, alkanoyl of 2 to 10 carbon atoms, substituted alkanoyl of 2 to 10 carbon atoms, with a substituent selected from the group consisting of nitro, phenyl, halo, cyano, carboxyl and sulfo, acyl of aromatic hydrocarbon carboxylic acids having 7 to 15 carbon atoms, substituted acyl of aromatic hydrocarbon carboxylic acids having from 7 to 15 carbon atoms with a substituent selected from the group consisting of lower alkyl, nitro, halo, cyano, carboxyl and sulfo; and in which A_2 is selected from the group consisting of A'_2 and the activated methylene group —CO—CH_2—X, in which X has the same meaning as defined above with the proviso that whenever A_2 is hydrogen, then X is not acetyl; (2) from 0% to 30 % by weight of a surfactant; (3) from 0% to 25% by weight of thickeners; and (4) from 40% to 99.9% by weight of water.

5. An aqueous preparation for the dyeing of human hair consisting essentially of (1) from 0.1% to 5% by weight of an oxidation dyestuffs combination of a developer component, and a coupling component in substantially equimolar amounts,

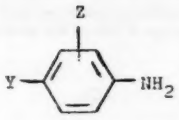
said coupling component consisting essentially of a diamino-nitro-benzene compound of the formula selected from the group consisting of



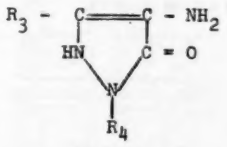
and



in which X is an electrophilic substituent selected from the group consisting of cyano, alkanoyl of 2 to 10 carbon atoms, substituted alkanoyl of 2 to 10 carbon atoms with a substituent selected from the group consisting of nitro, phenyl, halo, cyano, carboxyl and sulfo, acyl of aromatic hydrocarbon carboxylic acids having 7 to 15 carbon atoms, substituted acyl of aromatic hydrocarbon carboxylic acids having from 7 to 15 carbon atoms with a substituent selected from the group consisting of lower alkyl, nitro, halo, carboxyl and sulfo, cycloalkylcarbonyl of 6 to 10 carbon atoms, alkoxycarbonyl of 2 to 10 carbon atoms, cycloalkoxycarbonyl of 6 to 10 carbon atoms, phenylalkoxycarbonyl of 8 to 16 carbon atoms, furoyl, and thenoyl, and A_2 is a member selected from the group consisting of hydrogen, alkyl of 1 to 10 carbon atoms, hydroxyalkyl of 1 to 10 carbon atoms, N,N-dialkyl-aminoalkyl of 3 to 18 carbon atoms, alkanoyl of 2 to 10 carbon atoms, substituted alkanoyl of 2 to 10 carbon atoms with a substituent selected from the group consisting of nitro, phenyl, halo, cyano, carboxyl and sulfo, acyl of aromatic hydrocarbon carboxylic acids having 7 to 15 carbon atoms, substituted acyl of aromatic hydrocarbon carboxylic acids having from 7 to 15 carbon atoms with a substituent selected from the group consisting of lower alkyl, nitro, halo, cyano, carboxyl and sulfo, and the activated methylene group —CO—CH_2—X, in which X has the same meaning as defined above; said developer component is selected from the group consisting of (a) aromatic polyfunctional amines of the formula



wherein Y is a member selected from the group consisting of OH, NH_2, NHR′, NR′R″ and NHC_6H_5 and Z is a meter selected from the group consisting of H, R′, Y and OR′, where R′ and R″ are members selected from the group consisting of alkyl and hydroxyalkyl having 1 to 4 carbon atoms, (b) 4-aminopyrazolones of the formula



wherein R_3 is a member selected from the group consisting of hydrogen, phenyl, hydroxyphenyl, sulfonylphenyl, sulfonamidophenyl, aminophenyl, alkylolphenyl, alkylphenyl, alkylamino-phenyl, di-alkylaminophenyl, where the alkyls and alkylols have 1 to 4 carbon atoms, pyridyl, COOH, COOR′, $CONH_2$, CONHR′ and CONR′R″ where R′ and R″ have the above defined meanings, and R_4 is a member selected from the group consisting of hydrogen, phenyl, hydroxyphenyl, sulfonylphenyl, sulfonamidophenyl, aminophenyl, chlorophenyl,

carboxyphenyl, carbamidophenyl, carbamidoalkylphenyl, carbamidodialkylphenyl, alkylolphenyl, alkylphenyl, alkylaminophenyl, dialkylaminophenyl, where the alkyls and alkylol have 1 to 4 carbon atoms, and pyridyl, and (c) water-soluble acid addition salts of said 4-aminopyrazolones; (2) from 0% to 30% by weight of a surfactant; (3) from 0% to 25% by weight of thickeners; and (4) from 40% to 99.9% by weight of water.

3,907,495

PROCESS FOR THE DYEING OR PRINTING OF NITROGEN CONTAINING TEXTILE MATERIALS

Fritz Meininger, Frankfurt (Main); Klaus Hunger, Kelkheim; Fritz Osterloh, Bad Soden, and Klaus Berner, Hofheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

Filed Oct. 11, 1973, Ser. No. 405,427

Claims priority, application Germany, Oct. 14, 1972, 2250450

Int. Cl.[2] D06P *1/06, 1/39*

U.S. Cl. 8—39 **5 Claims**

1. Process for dyeing or printing nitrogen containing native or synthetic fibrous materials, which comprises the dyeing or printing of the said fibrous materials with a water-soluble dyestuff of the formula

$$F - \bar{Y} - \left(SO_2 - CH_2 - CH_2 - N \begin{matrix} CH_2 - COOZ \\ CH_2 - COOZ \end{matrix} \right)_n$$

in which F represents the rest of a monoazo-or 1 amino-4-phenyl-amino-anthraquinone-2-sulfonic acid dyestuff, Y represents a direct linkage or one of the groups

$$-CH_2-,$$

$$-CH_2-CH_2-, \quad -\overset{H}{N}- \text{ or } -\overset{alkyl}{N}- ,$$

Z represents a hydrogen or alkali metal atom or the ammonium group, and n represents the integer 1,2 or 3, at a temperature between about 20° and about 115° C, and at a pH-value between about 4.0 and about 7.5.

3,907,496

DRY CLEANING VARIOUS ARTICLES

Jean Néel, Lyon, and Bernard Papillon, Lyon-La-Mulatiere, both of France, assignors to Societe Rhone-Progil, Paris, France

Continuation of Ser. No. 218,021, Jan. 14, 1972, abandoned. This application May 13, 1974, Ser. No. 469,364

Claims priority, application France, Jan. 18, 1971, 71.01434

Int. Cl. D06l *1/00*

U.S. Cl. 8—142 **9 Claims**

6. Bath according to claim 4, wherein said solvent is perchloroethylene.

3,907,497

CATALYSIS WITH ODOR FREE HYDROXYMETHANESULFONIC ACID IN THE FINISHING OF CELLULOSIC TEXTILES

Robert M. Reinhardt, New Orleans; Russell M. H. Kullman; Norton A. Cashen, both of Metairie, and John D. Reid, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 10, 1973, Ser. No. 404,975

Int. Cl.[2] D06M *9/00, 13/34*

U.S. Cl. 8—184 **8 Claims**

1. A process for the treatment of cellulose containing textiles to give durable press properties in which odor-free hydroxymethanesulfonic acid is employed as catalyst in the absence of sulfurous acid and HSO_3^- cation, said process consisting of:

a. preparing hydroxymethanesulfonic acid by dissolving 2.3 parts of paraformaldehyde at room temperature in 6.3 parts of sulfurous acid in sufficient water to give 8.4 parts of odor-free hydroxymethanesulfonic acid;

b. adding about from 0.04 to 0.2 part of the hydroxymethanesulfonic acid to a solution contaiing from 9 to 15 parts of an N-methylol finishing agent selected from the group consisting of dimethylol methyl carbamate and dimethylol hydroxyethyleneurea, and making the solution to 100 parts;

c. impregnating a textile material containing at least 35% cotton with the solution from step (b) to apply a finish thereto;

d. heat treating the impregnated textile to cure the finish; and

e. washing the cured textile material.

3,907,498

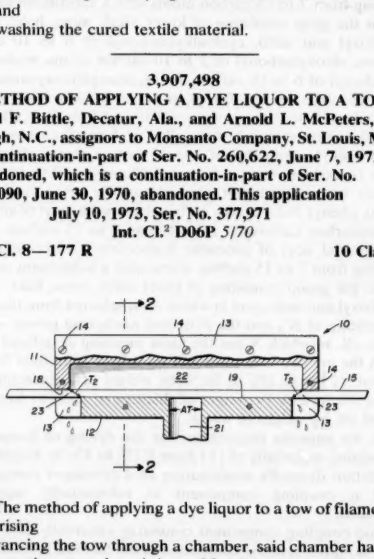
METHOD OF APPLYING A DYE LIQUOR TO A TOW

David F. Bittle, Decatur, Ala., and Arnold L. McPeters, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 260,622, June 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 51,090, June 30, 1970, abandoned. This application July 10, 1973, Ser. No. 377,971

Int. Cl.[2] D06P *5/70*

U.S. Cl. 8—177 R **10 Claims**



1. The method of applying a dye liquor to a tow of filaments, comprising

a. advancing the tow through a chamber, said chamber having an opening at each end thereof for the passage of tow into and out of the chamber and for the passage of a dye liquor out of the chamber, passing said dye liquor through the two in a direction countercurrent to the tow at one of the openings and concurrent with the tow at the other opening, filling the openings at the ends of the chamber with said tow filled with dye liquor, and

b. forcing a dye liquor into the chamber at a point between the openings in the chamber to fill the chamber with dye liquor and force said dye liquor through the tow and out of the chamber at said openings, said dye liquor being forced into the chamber at such a rate that the dye liquor flow rate outward through each of the openings in the chamber is at least

$$x = 3{,}000T_2\sqrt{\frac{WN}{h}\left(\frac{\mu}{\rho}\right)}$$

where x is the dye liquor flow rate in gallons per minute, T_2 is the thickness in inches of the dye liquor stream flowing through each opening, W is the width in inches of each said dye liquor stream and the tow, h is the thickness in inches of the tow passing through said openings, N is the number of filaments in the tow, μ is the viscosity of the dye liquor in pounds per foot-second, and ρ is the density of the dye liquor in pounds per cubic foot.

3,907,499
NOVEL COTTON FIBER ASSEMBLIES OF INCREASED ABSORBENCY AND METHOD

Peter Ingram; Brian W. Jones, both of Raleigh; Anton Peterlin, Durham; Joel Lawson Williams, Cary, and Donna Kimes Woods, Apex, all of N.C., assignors to Cotton, Incorporated, New York, N.Y.

Filed June 25, 1973, Ser. No. 372,953
Int. Cl.[2] D06M *13/34*
U.S. Cl. 8—181 **12 Claims**

1. A process for producing a cotton fiber assembly having increased absorbency, which process comprises

A. stabilizing cotton fibers in their never-dried botanical growth state by treating the never-dried fibers with at least one blocking agent and

B. forming the stabilized cotton fibers into a fiber assembly.

3,907,500
SYSTEM FOR ENRICHMENT BY DUAL TEMPERATURE EXCHANGE

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Continuation of Ser. No. 822,975, June 25, 1959, abandoned, which is a division of Ser. No. 188,925, Sept. 29, 1950, Pat. No. 2,895,803. This application Sept. 26, 1966, Ser. No. 587,362
Int. Cl. C01b *4/00*
U.S. Cl. 423—563 **15 Claims**

1. An improvement in a method of producing a substance containing concentrated therein an isotope of an element by exchanging, at two different temperatures, said isotope with another isotope of the same element between chemically different first and second fluid substances which are physically separable from each other and which are each capable of containing each of said isotopes; the method improved being of the type in which

a. a stream of said first fluid is passed in a flow through each of the first and second units, in that order, of a pair of exchange units,

b. a stream of said second fluid is passed in a flow through each of the second and first units of said pair, in that order,

c. said flows are passed through said units in countercurrent and are contacted in each of the units of said pair to cause an exchange of isotopes of the element between said first and second fluids,

d. said first and second units are maintained at different temperatures such as to cause said stream of said first fluid to become enriched with respect to said isotope in passing through said first unit and to become impoverished with respect to said isotope in passing through said second unit, while causing said flow of second fluid to become enriched with respect to said isotope in passing through said second unit and to become impoverished with respect to said isotope in passing through said first unit,

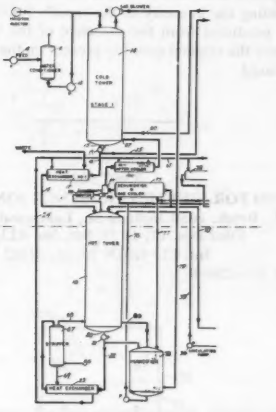
and in which

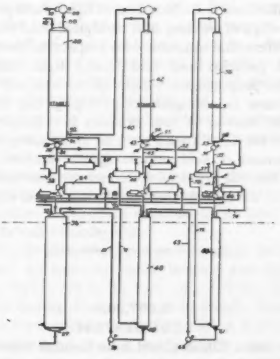
e. said first fluid is a vaporizable liquid and said second fluid is a carrier gas, and

f. said first unit is maintained relatively cold and said second unit is maintained relatively hot,

said improvement characterized in that

g. impoverished first fluid passing from the second unit is passed to a separate stripping zone where second fluid is stripped therefrom, said stripping being effected by (1) passing thereto first fluid in gaseous phase, the uncondensed portions of which, with the stripped content of second fluid, are passed to said second unit, and by (2) also passing the stripped first fluid and the condensed portions of the first fluid in gaseous phase, as they leave the stripping zone, in heat exchange relation to the first fluid in liquid phase being passed to said stripping zone from said second unit, whereby (3) the temperature in the stripping zone is substantially higher, and the temperature of said stripped first fluid after being subjected to said heat exchange is also higher, than the temperature of the first fluid leaving the second unit of said pair of units.





3,907,501
RAPID DETECTION SYSTEM FOR BENZILATES

Samuel Sass, Bel Air; John J. Martin, Edgewood, and William D. Ludemann, Jr., Kingsville, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 8, 1966, Ser. No. 578,940
Int. Cl.² G01N *31/22*
U.S. Cl. 23—230 R **8 Claims**

1. A rapid method for the detection of trace quantities of benzilates on surfaces, which comprises:

A. swabbing a surface with a polyhydric aliphatic alcohol moistened fibrous swab,

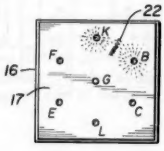
B. applying to said exposed moistened swab, in sequential order, the reagents, acetic anhydride, an oxidizing agent selected from the group consisting of potassium dichromate and ferric chloride, and a concentrated dehydrating acid selected from the group consisting of sulfuric acid, polyphosphoric acid, and trifluoracetic acid,

C. recording the intensity of the rapidly formed intense blue color produced from the presence of the benzilate agent, whereby the original quantity present on the surfaces can be calculated.

3,907,502
METHOD FOR IDENTIFYING BENCE JONES PROTEINS

Miless L. Brink, 1050 Holland St., Lakewood, Colo. 80215

Filed Dec. 11, 1973, Ser. No. 423,829
Int. Cl.² G01N *33/16, 31/02*
U.S. Cl. 23—230 B **8 Claims**



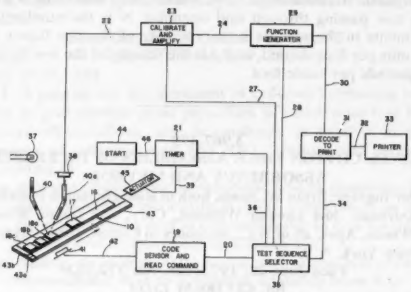
1. The method of identifying the presence of the free light chain proteins that characterize myelomas in biological fluids that may additionally include bound light chain proteins comprising the steps of treating said biological fluid with a solution having a differential reaction with respect to the defined free light chain proteins and said bound light chain proteins whereby the proportional weight of the reacted bound light chain proteins is changed, centrifuging the treated fluid whereby the heavier of said proteins is concentrated in the sediment of the centrifuged sample, and testing the supernatant component of said sample against known antisera for kappa and lambda types of myeloma proteins and/or control specimens to determine characteristics of said sample.

3,907,503
TEST SYSTEM

Cleo Elmer Betts, Elkhart, and John Kendall Marsh, Granger, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 21, 1974, Ser. No. 435,001
Int. Cl.² G01N *21/06, 21/20, 21/28*
U.S. Cl. 23—253 R **38 Claims**

1. A semi-automatic test system for determination of chemical constituents in a fluid, comprising a carrier member, a plurality of test reagents on said carrier member in predetermined relation, each of said test reagents being reactable with a specific constituent in a fluid and code means on said carrier member for use in identifying the test reagents located on said carrier member, code sensing means for sensing said code



means, reaction sensing means operable responsive to reactions of said test reagents respectively to provide output signals, and readout means controlled by said code sensing means and responsive to the output signals from said reaction sensing means.

3,907,504
BLOOD OXYGENATION SYSTEM INCLUDING AUTOMATIC MEANS FOR STABILIZING THE FLOW RATE OF BLOOD THERETHROUGH

Gary W. Hammond, Ballston Lake; Donald R. Ingenito, Scotia, and Gunnar E. Walmet, Schenectady, all of N.Y., assignors to General Electric Company, Milwaukee, Wis.

Filed Apr. 6, 1973, Ser. No. 348,711
Int. Cl.² A61M *1/03*
U.S. Cl. 23—258.5 **7 Claims**

1. An apparatus for extracorporeally oxygenating the blood of a living patient comprising in combination

i. at least one pumping means for the blood,

ii. oxygenating means for the blood,

iii. means for sensing and signalling changes in the pressure and volume of blood passing through said apparatus, said sensing and signalling means comprising:

a. a hollow chamber of a selectively fixed and adjustable volume and comprising a base piece and a cover piece;

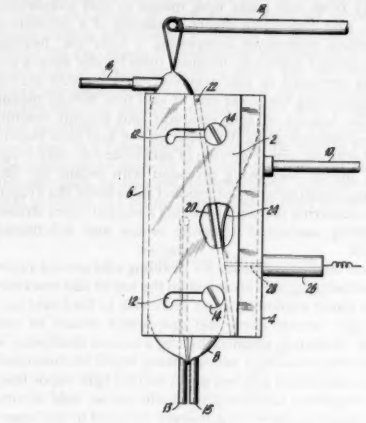
b. a compliant reservoir for holding said blood, said reservoir being disposed within said hollow chamber and including an inlet and an outlet port for said blood; said hollow chamber substantially limiting the maximum expansion volume of said complaint reservoir and

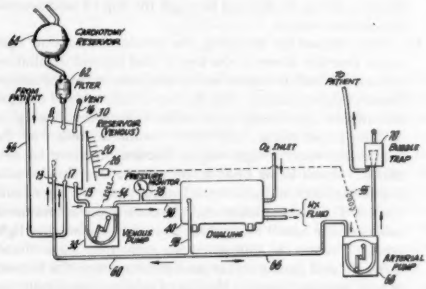
c. motion activated means in said hollow chamber for generating an electrical signal proportionate to changes in the size of said compliant reservoir, and

d. adjusting means movably attaching said cover piece to said base piece to permit selective adjustment of the volume of said hollow chamber by movement of said cover piece relative to said base piece, and

iv. pump speed controlling means being operatively con-

nected to receive said signal from said motion activated means and to automatically adjust the operation of said





pumping means so as to move said blood through said apparatus at a flow rate responsive to said signal.

3,907,505

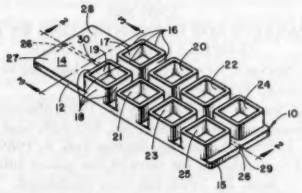
SELECTIVELY DETACHABLE APPARATUS

Glenn Lee Beall, Gurnee, and Fred K. White, Glen Ellyn, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 30, 1973, Ser. No. 365,158

Int. Cl.[2] B01L *3/00*

U.S. Cl. 23—259 **5 Claims**



1. An organoplastic device having a plurality of test wells for receiving material, the test wells being formed on a generally planar base, the base having a top and a bottom surface, and having at least one straight groove extending edge to edge in the bottom surface and extending toward the upper surface, each said groove providing a locus for frangible separation of the formed test wells, the residue above each said groove constituting a frangible member for the said separation, each frangible member being reinforced by at least one solid rib member transverse to the respective groove within the groove and dependently contacting the upper portion of the groove, the total thickness of said rib member and said frangible member being less than the thickness of said generally planar base.

3,907,506

APPARATUS FOR THE PREPARATION OF ALKALINE HYPEROXIDE

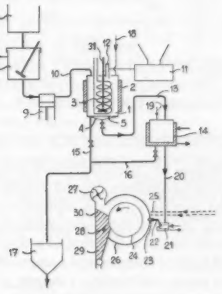
Jean Malafosse, Lyon, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Division of Ser. No. 268,835, July 3, 1972, Pat. No. 3,816,604. This application Dec. 10, 1973, Ser. No. 423,504

Claims priority, application France, Mar. 17, 1972, 72.09323

Int. Cl.[2] B01J *2/24*

U.S. Cl. 23—260 **3 Claims**



1. An apparatus for the preparation of alkaline peroxide from a concentrated aqueous solution of alkaline hydroxide and hydrogen peroxide, comprising

a double-envelope fluid-tight reactor having a double-envelope wall, said reactor being provided with means for cooling and for maintaining the temperature within said reactor at less than 10°C, means for immediately dispersing solid alkaline hydroxide particles and for agitation, first means for introduction of a first reagent, second means for introduction of a second reagent, means for drawing-off of a concentrated aqueous solution of the reagents from said reactor and grid means to prevent exit from the reactor into the drawing-off means of large particles of alkaline hydroxide;

a storage receptacle provided with cooling means to maintain said solution cold and connected to said reactor via said drawing off means;

means for receiving and then spraying the said cold solution, said receiving and spraying means comprising an atomisation device of the sheet or flat jet type and formed of polytetrafluoroethylene;

means for providing the rapid and punctual dehydration of said cool solution by shock heating and for providing alkaline hydroxide in the form of a powder, comprising a scaler or flaking drier having an internally heated rotating cylinder for receiving said cold solution as atomized from said atomization device, said cylinder being provided externally with a coating of electrolytic nickel, said cylinder being situated within a fluid-tight compartment having a dry zone and a moist zone separated by baffle means, said compartment being provided in said moist zone with a device for the aspiration of moist air and in said dry zone with scraper means for the recovery of the hyperoxide by scraping from the drum and with solids

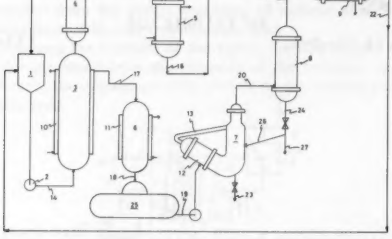
withdrawal means for the removal of the so-scraped alkaline hyperoxide.

3,907,507

NOVEL APPARATUS FOR THE OBTENTION OF SUBSTITUTED 1,2-DIHYDROQUINOLINES

Heliodoro Monroy Rivera, Insurgentes Sur 591-7th Floor, Mexico 18, D. F., Mexico

Continuation-in-part of Ser. No. 137,217, April 26, 1971, abandoned. This application Mar. 6, 1973, Ser. No. 338,633
Int. Cl.[2] B01D *3/02;* **B01J** *8/02;* **B01D** *3/014;* **C07D** *215/00*
U.S. Cl. 23—263 **2 Claims**



1. An apparatus for the continuous production of substituted 1,2-dihydroquinolines by the reaction of an aromatic amine with the corresponding substituted carbonyl compound in the presence of a catalyst, said apparatus comprising:

1. first reactor means consisting of a tower having a packed extended surface therein and means associated therein to heat said tower and having a height sufficient to provide the necessary residence time for the reaction mixture ascending therethrough;
2. means for mixing and feeding the reactants and catalyst to the bottom portion of said first reactor means whereby said reactants flow upwardly therethrough producing a reaction mixture comprised of a liquid and a vapor portion;
3. second reactor means consisting of a tower having a packed extended surface therein and means associated therewith to heat said tower and having a height less than the height of said first reactor means;
4. means to remove the liquid portion of said reaction mixture from the top portion of said first reactor means and feed said liquid portion to the top of said second reactor means whereby said liquid portion descends therethrough and said reaction is completed thereby producing a first liquid mixture containing the substituted product and unreacted aromatic amine;
5. first distillation means for distilling the vapor portion of said reaction mixture;
6. means to feed said vapor portion of said reaction mixture from said first reactor means to said first distillation means whereby a first distillation is conducted producing a first heavy liquid fraction which is recycled to the top portion of said first reactor means as reflux and a first light vapor fraction comprising unreacted carbonyl compound;
7. a first condenser means for condensing said first light vapor fraction and means to feed said first light vapor fraction from said first distillation means to said first condenser means, said first condenser means being provided with a first recycle means to recycle the condensed first light vapor fraction to said mixing and feeding means;
8. a surge tank means and means to feed said first liquid mixture from the bottom portion of said second reactor means to said surge tank means;
9. evaporator means for separating the substituted product from the unreacted aromatic amine in said first liquid mixture and pumping means for pumping said first liquid mixture from said surge tank means to said evaporator means, said evaporator means consisting of a circulating convection evaporator comprising a reservoir, heating means in said reservoir, inclined tube bundle means externally arranged of said reservoir, first conduit means communicating the lower end of said tube bundle means with the bottom of said reservoir and second conduit means communicating the upper end of said tube bundle means with the upper portion of said reservoir, said evaporator means also being provided with means for discharging liquid substituted product therefrom, the evaporation occurring therein producing a second vapor stream containing unreacted aromatic amine and substituted product;
10. second distillation means for distilling said second vapor stream and integrally arranged on the top of said reservoir and in direct communication therewith to feed said second vapor stream from said evaporator means to said second distillation means, whereby a second distillation is conducted producing a second heavy liquid fraction comprising substituted product and a second light vapor fraction comprising unreacted aromatic amine; said second heavy liquid fraction being thereby recycled to said reservoir of said evaporator means and said second light vapor fraction being discharged through the top of said second distillation means;
11. reflux means for recycling the condensed second light vapor fraction down to the top of said second distillation means, said reflux means being integrally arranged and in direct communication with the top of said second distillation means and having total reflux means comprising an annular vessel within said reflux means to collect all the condensed second light vapor fraction, the top of said annular vessel being open to permit the overflow of said condensed second light vapor fraction into the top of said second distillation means and the central cross section of said annular vessel being such that the said second light vapor fraction is permitted to upwardly pass therethrough, and partial reflux means connecting the bottom of said annular vessel to the top of said second distillation means, said annular vessel being provided with a liquid unreacted aromatic amine discharge means and second recycle means to recycle said liquid unreacted aromatic amine to said mixing and feeding means; and
12. vertical condenser means for condensing said second light vapor fraction, said vertical condenser means being integrally arranged and in direct communication with the top of said reflux means for receiving said second light vapor fraction and to discharge therethrough and recycle the condensed second light vapor fraction into said annular vessel of said total reflux means.

3,907,508

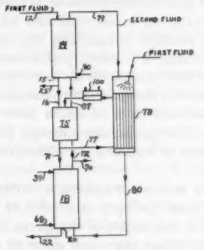
APPARATUS FOR CONCENTRATING BY DUAL TEMPERATURE EXCHANGE

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 828,926, July 16, 1959, abandoned, which is a continuation-in-part of Ser. No. 188,925, Sept. 29, 1950, Pat. No. 2,895,803. This application Feb. 6, 1969, Ser. No. 797,191The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.
Int. Cl. B01d *11/04;* **C01b** *4/00*
U.S. Cl. 23—270.5 **12 Claims**

1. Apparatus for producing a fluid containing a first material concentrated therein by exchanging, at two different temperatures, said first material with a second material between chemically different first and second fluids which are physically separable from each other, which are each capable of containing each of said materials, and the first of which is

a liquid; said apparatus being of a type which comprises, in combination, (*a*) a series of at least two pairs of exchange units each of which has first fluid and second fluid ingress and egress means for countercurrent flow of the two fluids therethrough; (*b*) means in each of said units for mixing said two fluids therein to cause an exchange of the said materials between the two fluids; (*c*) means for maintaining a first unit of each pair at a temperature to cause the first fluid flowing therethrough to become enriched and the second fluid flowing therethrough to become impoverished with respect to said first material; (*d*) means for maintaining the second unit of each pair at a temperature to cause the second fluid flowing therethrough to become enriched and the first fluid flowing therethrough to become impoverished with respect to said first material; (*e*) means connected to the enriched first fluid



egress means of the first unit of each pair and to the first fluid ingress means of the second unit of said pair for transferring a first part of the flow of enriched first fluid from the first unit of each pair to the second unit of said pair; (*f*) means connected to the enriched first fluid egress means of the first unit of each pair except the last pair of the series and to the first fluid ingress means of the first unit of the next succeeding pair for transferring a second part of the enriched first fluid from the first unit of each pair except the last of said pairs to the first unit of the next succeeding pair; (*g*) means connected to the enriched second fluid egress means of the second unit of each pair and to the second fluid ingress means of the first unit of said pair for transferring a first part of the flow of enriched second fluid from the second unit of each pair to the first unit of said pair; (*h*) means connected to the enriched second fluid egress means of the second unit of each pair except the last pair of the series and to the second fluid ingress means of the second unit of the next succeeding pair for transferring a second part of said flow of enriched second fluid from the second unit of each pair except the last to the second unit of the next succeeding pair of units; (*i*) means connected to the impoverished first fluid egress means of the second unit of each pair except the first pair of the series and to the first fluid ingress means of the second unit of the next preceding pair fro transferring impoverished first fluid from the second unit of each pair of units except the first pair to the second unit of the next preceding pair of units; (*j*) means connected to the impoverished second fluid egress means of the first unit of each pair except the first pair of the series and to the second fluid ingress means of the first unit of the next preceding pair for transferring impoverished second fluid from the first unit of each pair of units except the first pair to the first unit of the next preceding pair of units; (*k*) means connected to the second fluid ingress means of the second unit of said first pair of units for delivering a flow of second fluid thereto; and (*l*) means connected to an enriched fluid egress means of the last pair of units for removing enriched fluid from the last pair of exchange units of said series; said apparatus characterized in that it further comprises the following cooperating components in the combination:

m. a first heat exchange means;

n. a second heat exchange means;

o. said first heat exchange means being a direct contact heat exchange means and said second heat exchange means comprising an indirect contact heat exchange means;

p. means interconnecting said first and second heat exchange means in series for establishing a cyclic flow of liquid first fluid therebetween and comprising means for maintaining said cyclic flow separated from said flows of second fluid except in said direct contact heat exchange means;

q. said first heat exchange means (*m*) being connected in circuit in the means (*g*) by which enriched second fluid is transferred from a second unit to a first unit of a pair of units, for effecting heat transfer between said enriched second fluid and said cyclic flow of first fluid therein;

r. said first heat exchange means (*m*) also being connected in circuit in the means (*e*) by which enriched first fluid is transferred from a first unit to a second unit of a pair of units, for effecting heat transfer between said enriched second fluid and said enriched first fluid as well as said cyclic flow of first fluid therein; and

s. said second heat exchange means (*n*) having connections in circuit in the means (*k*) by which said cyclic flow is brought into heat exchange relation to the second fluid being delivered by said means (*k*).

3,907,509

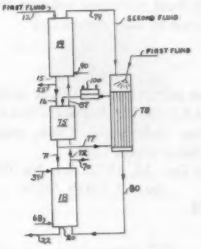
APPARATUS FOR CONCENTRATING BY DUAL TEMPERATURE EXCHANGE

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 828,926, July 16, 1959, Pat. No. 3,142,540, which is a continuation-in-part of Ser. No. 188,925, Sept. 29, 1950, Pat. No. 2,895,803. This application Mar. 11, 1968, Ser. No. 712,287The portion of the term of this patent subsequent to Apr. 6, 1988, has been disclaimed.

Int. Cl. B01d *11/04*; **C01b** *4/00*; **B01d** *11/00*

U.S. Cl. 23—270.5 **6 Claims**



1. Apparatus for producing a fluid containing a first material concentrated therein by exchanging, at two different temperatures, said first material with a second material between chemically different fluids which are physically separable from each other and which are each capable of containing each of said materials, which apparatus comprises, in combination, (a) a pair of exchange units each of which has first fluid and second fluid ingress and egress means for countercurrent flow of the two fluids therethrough; (b) means in each of said units for mixing said two fluids therein to cause an exchange of the said materials between the two fluids; (c) means for maintaining a first unit of said pair at a temperature to cause the first fluid flowing therethrough to become enriched and the second fluid flowing therethrough to become impoverished with respect to said first material; (d) means for maintaining the second unit of said pair at a temperature to cause the second fluid flowing therethrough to become enriched and the first fluid flowing therethrough to become impoverished with respect to said first material; (e) means connecting the enriched first fluid egress means of the first unit of said pair to the first fluid ingress means of the second unit of said pair for transferring a flow of enriched first fluid

from the first unit of said pair to the second unit of said pair; (f) means connecting the enriched second fluid egress means of the second unit of said pair to the second fluid ingress means of the first unit of said pair for transferring a flow of enriched second fluid from the second unit of said pair to the first unit of said pair; (g) means connected to the second fluid ingress means of the second unit of said pair of units for delivering a flow of second fluid thereto; and (h) means connected to an enriched fluid egress means of said pair of units for withdrawing enriched fluid therefrom; said apparatus further comprising the following cooperating components in the combination:

i. a first heat exchange means;

j. a second heat exchange means;

k. said first heat exchange means being a direct contact heat exchange means and said second heat exchange means comprising an indirect contact heat exchange means;

l. means interconnecting said first and second heat exchange means in series for establishing a cyclic flow of liquid first fluid therebetween and comprising means for maintaining said cyclic flow separated from said flows of second fluid except in said direct contact heat exchange means;

m. said first heat exchange means (i) being connected in circuit with the means (f) by which enriched second fluid is transferred from the second unit to the first unit of said pair of units, for effecting heat transfer between said enriched second fluid and said cyclic flow of first fluid therein;

n. said first heat exchange means (i) also being connected in circuit with the means (e) by which enriched first fluid is transferred from the first unit to the second unit of said pair of units, for effecting heat transfer between said enriched second fluid, said enriched first fluid and said cyclic flow of first fluid therein; and

o. said second heat exchange means (j) being connected in circuit with the means (g), whereby said cyclic flow is brought into heat exchange relation to the second fluid being delivered by said means (g).

3,907,510

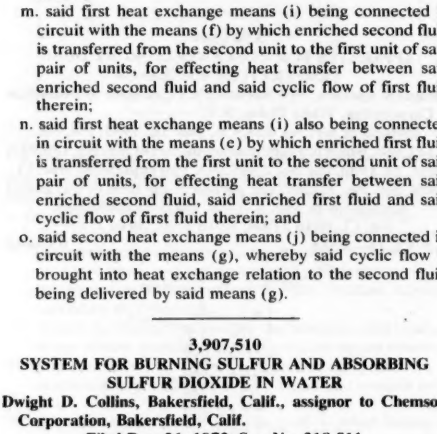
SYSTEM FOR BURNING SULFUR AND ABSORBING SULFUR DIOXIDE IN WATER

Dwight D. Collins, Bakersfield, Calif., assignor to Chemsoil Corporation, Bakersfield, Calif.

Filed Dec. 26, 1972, Ser. No. 318,511

Int. Cl. C01b *17/54*

U.S. Cl. 23—278 **7 Claims**



1. A system for burning sulfur dioxide and for absorbing the sulfur dioxide in water, comprising:

a sulfur-burning tower comprising an enclosure formed of a bottom, a peripheral sidewall and a top, a divider disposed at an intermediate level in said enclosure dividing it into a lower chamber and tapered upper chamber reducing in cross-section as it rises in elevation, said divider extending inwardly from the side-wall and having a passage therethrough, the divider forming a peripheral shelf in the upper chamber surrounding said passage, a primary air inlet discharging into the said lower chamber, a secondary air inlet discharging into the upper chamber adjacent to said shelf so directed as to make gas flow turbulent in the upper chamber and encourage contact with the wall of the chamber, external cooling fin means attached to the wall of the upper chamber to dissipate heat therein and cool the gases in the said upper chamber to reduce the erosion of downstream components and permit higher temperatures in the lower chamber and the use of minimal quantities of air, and an outlet port passing through the enclosure at an upper elevation of the upper chamber;

a quenching chamber having an inlet and an outlet, its inlet being connected to the outlet of the sulfur-burning tower, said quenching chamber comprising a tube made of lead having an inner wall and an outer wall and a quenching passage connecting the quenching chamber inlet and outlet, a cooling jacket surrounding the lead tube and in fluid contact with its outer wall, and means to inject water into the quenching passage comprising a port through the lead tube to inject water from the cooling jacket into the quenching passage further to cool said gases in order to improve the absorption efficiency of the system;

an absorption tower comprising a vertically-rising absorption enclosure having a gas inlet at a lower elevation connected to the outlet of the quenching chamber, a gas outlet at an upper elevation open to atmosphere, and a product outlet at a lower elevation, a packing in said absorption enclosure between the gas inlet and gas outlet providing an environment for exposure of water to gases rising in the chamber, and water injection means discharging water onto the top of the packing so that water passes through the packing countercurrent to the rising gases; and

water supply means supplying water to the cooling jacket and to the water injection means of the absorption tower.

3,907,511

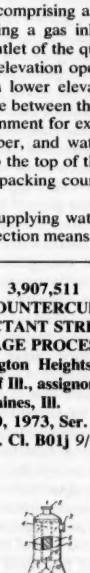
APPARATUS FOR COUNTERCURRENT CATALYTIC CONTACT OF A REACTANT STREAM IN A MULTIPLE-TAGE PROCESS

James T. Forbes, Arlington Heights, and James E. Gantt, Elmwood Park, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 20, 1973, Ser. No. 399,775

Int. Cl. B01j *9/12*

U.S. Cl. 23—288 G **7 Claims**



1. A unitary, multiple-stage reaction system for countercurrently contacting a fluid reactant stream with catalyst particles

movable through said system via gravity-flow, which system comprises, in combination:

a. a tubular-form, vertically-disposed reaction chamber;

b. at least two reaction zones within said chamber, each of said zones having coaxially-disposed, inner and outer tubular-form, catalyst-retaining screens forming (i) an annular-form catalyst-holding section therebetween, (ii) an annular-form void volume between the outer screen and the interior wall of said chamber and, (iii) a center reactant conduit;

c. in the lowermost of said reaction zones, (i) a first lower, imperforate transverse partition connected to said inner and outer catalyst-retaining screens, and to the interior wall of said chamber, said first lower partition terminating at said inner retaining screen, and (ii) a first, upper imperforate transverse partition connected to said inner and outer catalyst-retaining screens, and terminating at both the inner and outer screens;

d. at least one other of said reaction zones, vertically-disposed above said lowermost reaction zone, having (i) a second lower, imperforate transverse partition, connected to said inner and outer retaining screens, and to the interior wall of said chamber, terminating at said inner retaining screen, and, (ii) a second upper, imperforate transverse partition connected to said inner and outer retaining screens, and terminating at said outer screen;

e. catalyst-transfer conduits connecting a catalyst-holding section with the next succeeding lower catalyst-holding section, and catalyst-withdrawal conduits extending downwardly through the lower extremity of said chamber, whereby catalyst particles flow via gravity from one catalyst-holding section to a lower catalyst-holding section, and out of said chamber;

f. a first fluid reactant inlet port in said lowermost reaction zone at a locus between said first upper and said second lower imperforate transverse partitions, whereby a reactant stream passing through said first fluid reactant inlet port will pass downward through said annular-form void in said lowermost reactant section and laterally through said lowermost catalyst retaining section to said center reactant conduit;

g. a second fluid reactant inlet port in the bottom of said reaction chamber, in open communication with said center reactant conduit;

h. a reaction product outlet port in the upper end of said chamber, in open communication with the uppermost annular-form void volume; and,

i. a catalyst inlet port in the upper end of said chamber, in open communication, via catalyst-transfer conduits, with the uppermost catalyst-holding section;

said reaction system being further characterized in that said inner catalyst-retaining screen in said lowermost reaction zone extends from said first lower, imperforate transverse partition to said second lower, imperforate transverse partition and is imperforate along that portion of its length extending from said first upper, imperforate transverse partition to said second lower imperforate transverse partition.

3,907,512

METHOD FOR PRODUCING HIGH-POROSITY HIGH-SURFACE AREA, LOW-BULK DENSITY ALUMINA

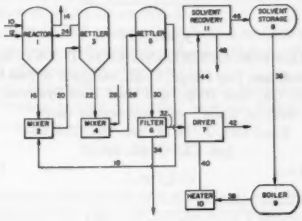
William C. Ziegenhain, and John H. Smith, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 218,882, Jan. 19, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,679

Int. Cl.[2] C01F *7/02;* **B01J** *11/58*

U.S. Cl. 23—293 A **10 Claims**

1. A method for producing low density, high porosity, high surface area alumina from an aqueous alumina mixture produced by the water hydrolysis of aluminum alkoxides and containing up to about 32 weight percent Al_2O_3, said method consisting essentially of drying said aqueous alumina mixture by contacting said aqueous alumina mixture with an alkanol vapor selected from the group consisting of alkanols containing from 1 to 8 carbon atoms and combinations thereof at a temperature to minimize condensation of said alkanol vapors



in the aqueous alumina mixture in an amount sufficient to produce alumina containing at least about 50 weight percent Al_2O_3 and having a pore volume from about 1.0 to about 2.75 cc/g, a loose bulk density from about 7.5 to about 25 lb/ft^3 and a surface area from about 260 to about 400 m^2/g.

3,907,513

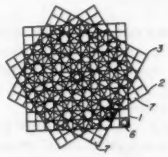
CONTROLLED POROSITY FILTER AND UNIFORM STRUCTURE COMPOSITES

Haskell Sheinberg, Los Alamos, N. Mex., assignor to The United States Energy Research and Development Administration, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,547

Int. Cl.[2] B32B *15/00;* **B01D** *39/08*

U.S. Cl. 29—191.2 **4 Claims**



1. A material having a controlled porosity which comprises a plurality of substantially parallel layers bonded together, each of said layers comprising a screen having (a) emplaced in each mesh thereof a substantially spherical particle which substantially reduces the size of the opening of said mesh, and (b) its screen meshes shifted a uniform distance relative to the screen meshes in adjoining layers.

3,907,514

ALUMINUM CARBON COMPOSITE SEAL MATERIAL

Joseph F. Demendi, St. Marys, Pa., assignor to Pure Carbon Company, Inc., St. Marys, Pa.

Division of Ser. No. 299,048, Oct. 19, 1972, Pat. No. 3,853,635. This application Oct. 16, 1974, Ser. No. 515,327

Int. Cl.[2] B23P *3/00*

U.S. Cl. 29—191.2 **1 Claim**

1. An aluminum carbon composite seal material comprising between 35 and 45 percent carbon by weight with the balance carbide reaction products and an aluminum-silicon alloy in turn comprising 14 to 19 percent silicon, 2 to 5 percent copper or nickel, 0 to 1 percent magnesium, titanium or iron, balance aluminum, said seal material having the following physical characteristics:

electrical resistance	20–60 micro-ohm inches
density	1.9 to 2.3 grams/cubic centimeter
transverse strength	at least 25,000 psi
Rockwell G hardness	80–100

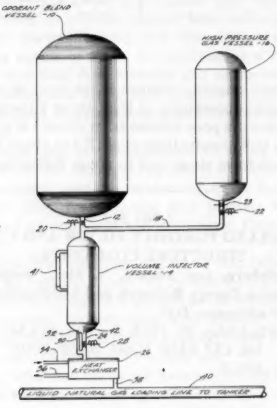
3,907,515

APPARATUS FOR ODORIZING LIQUID NATURAL GAS

David K. Mulliner, San Diego, Calif., assignor to San Diego Gas & Electric Co., San Diego and Dual Fuel Systems, Inc., Los Angeles, both of, Calif., part interest to each

Filed Oct. 2, 1972, Ser. No. 294,164
Int. Cl.[2] C10L *10/00*

U.S. Cl. 44—2 **13 Claims**



1. An apparatus for odorizing liquid natural gas comprising:

a. means for a source of an odorant-diluent solution;

b. an injection vessel having a predetermined volume in selective serial communication with the source means of odorant-diluent solution;

c. a gas vessel for a source of high pressure gas, the gas vessel being in selective serial communication with the injection vessel independently of the source means for the odorant-diluent, the high pressure gas being used to maintain a pressure in the injection vessel while odorant-diluent is in such vessel above the vapor pressure of the diluent and for ejecting the odorant-diluent solution from the injection vessel into the liquid natural gas to be odorized, the gas vessel maintaining the pressure independently of the liquid natural gas;

d. a heat exchanger between the injection vessel and the liquid natural gas to be odorized to cool the odorant-diluent solution to within a predetermined temperature range, the minimum temperature of the range being substantially higher than the boiling point of liquid natural gas;

e. normally closed valve means in the selective serial communication between the source means of odorant-diluent solution and the injection vessel;

f. normally closed valve means in the selective serial communication between the high pressure gas vessel and the injection vessel;

g. normally closed valve means between the injection vessel and the liquid natural gas to be odorized;

h. circuit means including:

i. means coupled to the valve means between the injection vessel and the liquid natural gas to be odorized to prevent the opening of such valve means and communication between the injection vessel and the liquid natural gas to be odorized unless the odorant-diluent solution in the heat exchanger is within the predetermined temperature range;

ii. means to open the normally closed valve between the source means of odorant-diluent and the injection vessel; and

iii. means to open the valve between the high pressure gas vessel and the injection vessel after the injection vessel has been filled with a volume of odorant-diluent from the source means thereof and after the normally closed valve between the odorant-diluent source means and the injection vessel has been closed.

3,907,516

MOTOR FUEL COMPOSITION

Joseph Brian Biasotti, and Frederick G. Oberender, both of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 18, 1973, Ser. No. 361,682
Int. Cl. C10l *1/18*

U.S. Cl. 44—58 **11 Claims**

1. A motor fuel composition comprising a major amount of a mixture of hydrocarbons in the gasoline boiling range from about 80° to 450°F. containing a minor amount effective to reduce intake valve deposits in a gasoline engine of an ester compound formed from a polymethylol alcohol from the group consisting of tetramethylolmethane, and polymethylol derivatives of ethane, propane, and butane in which the derivatives has at least three methylol groups, and an aliphatic hydrocarbon monocarboxylic acid from the group consisting of saturated aliphatic acids having substantially 14 to 24 carbon atoms and mixtures of substantially C_{14} to C_{24} aliphatic acids consisting of at least 50 percent of saturated acids, said ester compound having an average molecular weight ranging from about 825 to 1500.

3,907,517

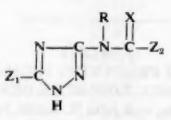
NORMALLY LIQUID HYDROCARBON COMPOSITIONS CONTAINING AMIDATRIAZALES

Motonobu Minagawa, Koshigaya; Mitsuo Akutsu, and Kenichi Nakagawa, both of Tokyo, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 211,647, Dec. 23, 1971, Pat. No. 3,849,370. This application May 28, 1974, Ser. No. 473,526
Int. Cl. C10l *1/24*

U.S. Cl. 44—63 **5 Claims**

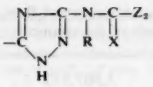
1. Hydrocarbon compositions which have an enhanced resistance to oxidative deterioriation in physical properties, consisting essentially of a hydrocarbon and at least one 3-amido-1,2,4-triazole in having the formula:



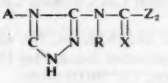
wherein:

a. R is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms;

b. Z_1 is selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms; aryl and alkyl aryl having from six to about eighteen carbon atoms; alkylene-alkoxy and alkylenearyloxy having from two to about eighteen carbon atoms and nitrogen-containing heterocyclic rings having from four to five ring carbon atoms and one to two ring nitrogen atoms;



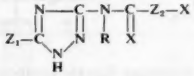
and



in which A is alkylene having from one to about eight carbon atoms;

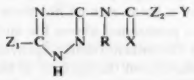
c. X is selected from the group consisting of oxygen and sulfur;

d. Z_2 is a benzene or naphthalene ring substituted by from one to two R_1 groups and from zero to two R_2 groups and i. R_1 is selected from the group consisting of OH, SH, SR_5 (where R_5 is selected from the group consisting of alkyl and alkylene carboxyalkyl having from one to four carbon atoms), and

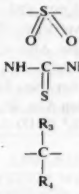


(where X is as in (c) above) and at least one R_1 is in the ortho position);

ii. R_2 is selected from the group consisting of alkyl, phenyl alkyphenyl, alkoxy, acyl, acyloxy, phenoxy and alkyl phenoxy having from one to about eighteen carbon atoms, halogen and amino; and



where Y is selected from the group consisting of oxygen, sulfur,



(where R_3 and R_4 are selected from the group consisting of hydrogen and alkyl having from one to three are at most two 1,2,4-triazole groups in the molecule.

3,907,518
DETERGENT MOTOR FUEL

Warren H. Machleder, Elkins Park, and Robert R. Kuhn, Lansdale, both of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 279,891, Aug. 11, 1972, Pat. No. 3,782,912. This application Sept. 19, 1973, Ser. No. 398,621The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.

Int. Cl.[2] C10L *1/18*

U.S. Cl. 44—66 **4 Claims**

1. A multi-functional additive composition suitable for addition to distillate hydrocarbon fuels having a major proportion of a hydrocarbon base fuel distilling with.n the gasoline distillation range, the additive composition comprising a mixture of

1. about 20 to 250 parts by weight of a tertiary alkyl primary amine having a branched bacckbone and wherein backbone tertiary alkyl primary amine has a total carbon atom content of 18 to 22 carbon atoms;
2. about 10 to 100 parts by weight of a surface active alkyl ammonium carboxylate salt-ethoxylated alkyl phenol ester of a trimer or dimer acid;
3. about 150 to 650 parts by weight of a hydrocarbonsoluble polybutene having a number average molecular weight (Mn) of from about 700 to about 3000.

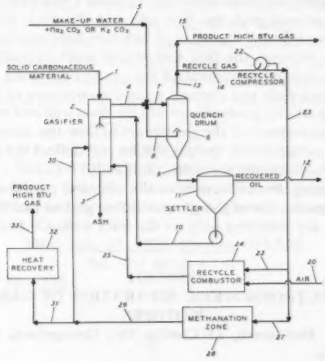
3,907,519
GASIFICATION OF SOLID CARBONACEOUS MATERIALS TO OBTAIN HIGH BTU PRODUCT GAS

Robert Paul Sieg, Piedmont, and Robert James White, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 252,450, May 11, 1972, Pat. No. 3,817,725. This application May 31, 1974, Ser. No. 475,061The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.

Int. Cl.[2] C10J *3/14*

U.S. Cl. 48—202 **10 Claims**



1. A process for converting solid carbonaceous material to combustible gases which comprises:

a. heating and reacting the solid carbonaceous material with reactive gases in a gasification zone to obtain said combustible gases and withdrawing the combustible gases from the gasification zone,

b. methanating at least a portion of said combustible gases in a methanation zone to obtain methanated gases, and

c. feeding at least a portion of said methanated gases through the gasification zone thereby increasing the methane content and BTU value of said combustible gases and transferring the sensible heat from said methanated gases to said gasification zone.

3,907,520
ELECTROSTATIC PRECIPITATING METHOD

A. Ben Huang, 3134 Woodrow Way, N.E., Atlanta, Ga. 30319, and Arnold L. Ducoffe, 3544 Paces Ferry Rd., N.W., Atlanta, Ga. 30339

Division of Ser. No. 249,167, May 1, 1972, Pat. No. 3,782,905. This application Oct. 11, 1973, Ser. No. 405,419

Int. Cl.[2] B03C *3/74, 3/88*

U.S. Cl. 55—4 **7 Claims**

1. A method of separating charged particles from a gas stream including the steps of:

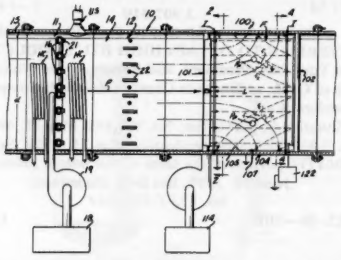
moving the gas stream with the charged particles entrained therein along a prescribed path through a tubular duct;

positioning a first open grid within the tubular duct so that the first grid extends generally transversely across the prescribed path;

positioning a second open grid within the tubular duct a prescribed distance downstream of the first grid so that the second grid extends generally transversely across the prescribed path;

electrically grounding the first grid and that portion of the duct wall between the first and second grids;

imposing an electrical potential of a prescribed value on the second grid with the same polarity as that on the particles



to generate an electrostatic repulsive force field between the second grid, the first grid and the duct wall which exerts a first component of force on the particles as they pass between the first and second grids opposite to the direction of movement of the gas stream along the prescribed path and exerts a second component of force on the particles generally toward the duct wall and normal to the movement of the gas stream to slow the movement of the particles with the gas stream and deflect the particles to the duct wall for collection; and,

preventing the collection of the charged particles on the upstream side of the grounded first grid so that the particles are collected only on the duct wall.

3,907,521

DIELECTROPHORETIC SEPARATION OF GASEOUS ISOTOPES

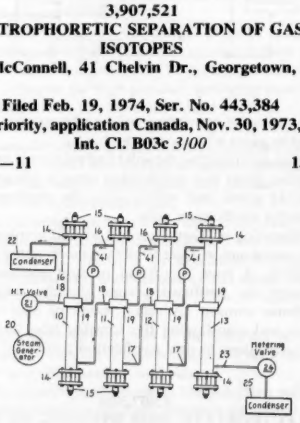
Denis B. McConnell, 41 Chelvin Dr., Georgetown, Ontario, Canada

Filed Feb. 19, 1974, Ser. No. 443,384

Claims priority, application Canada, Nov. 30, 1973, 187036

Int. Cl. B03c *3/00*

U.S. Cl. 55—11 **13 Claims**



1. A process for separating gaseous isotopes having different dipole moments and/or different molecular weights from a mixture, comprising admitting the mixture to a vertically elongated chamber, subjecting the mixture to a non-uniform transverse electric field, thereby to effect dielectrophoretic separation of the isotopes into a lighter fraction and a heavier fraction, producing a transverse temperature gradient within the chamber thereby to effect vertical separation of the fractions by convective countercurrent flow, and removing said fractions from the ends of the chamber.

3,907,522

METHOD FOR REMOVING A FLUORINE COMPOUND(S) FROM GASEOUS MIXTURE THEREWITH

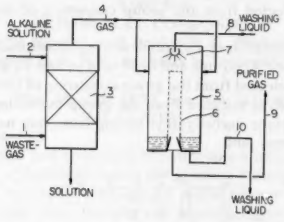
Youji Tsukamoto, and Sadao Kondo, both of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Apr. 26, 1974, Ser. No. 464,321

Claims priority, application Japan, May 10, 1973, 48-51833

Int. Cl.² B01D *50/00*

U.S. Cl. 55—71 **11 Claims**



1. A method for removing fluoride compounds comprising hydrogen fluoride and boron fluoride from a gaseous mixture containing the same, chracterized by introducing said gaseous mixture to a gas scrubber of gas-liquid contacting type, thereby removing from the gaseous mixture a portion of the fluoride compounds, and then delivering the so treated gaseous mixture, which contains fluoride compounds substantially comprising boron fluoride hydrate in mist form, to a mist-catching means comprising a porous filter medium in a filmy state having pores of a mean size of not more than 60 μ and one or more nozzles positioned above the surface of the medium, continuously or intermittently spraying water or an aqueous alkaline solution on the surface of the filter medium in substantially the same direction as that of the treated gaseous mixture, thereby removing a substantial amount of boron fluoride in the form of a hydrate from said gaseous mixture.

3,907,523

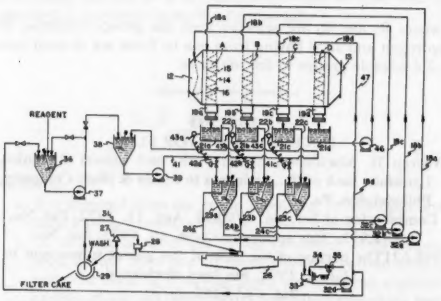
METHOD FOR REMOVING SO_2 FROM GASES

Deering D. Melin, Jr., Palo Alto, Calif., assignor to Krebs Engineers, Menlo Park, Calif.

Continuation-in-part of Ser. No. 318,204, Dec. 26, 1972, abandoned. This application Aug. 21, 1974, Ser. No. 499,208

Int. Cl.² B01D *53/14*

U.S. Cl. 55—73 **4 Claims**



1. In a scrubbing process for removing sulfur dioxide from waste gases, the process making use of a scrubber having a plurality of scrubber stages through which the gas is directed with each stage having separate means for introducing and for

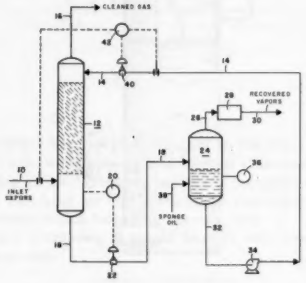
removing liquid scrubbing medium, the steps comprising passing the sulfur dioxide containing waste gases sequentially through each of said steps, continuously and separately supplying each stage with a milk of lime slurry as a scrubbing medium, the slurry for each stage being supplied from an independent mix-delay tank for each stage, supplying each of said mix-delay tanks with lime slurry removed from said stages, and supplying fresh make up slurry to each of said mix-delay tanks in such controlled amounts as to maintain the pH of the slurry removed from each scrubber stage within the range of 5.5 to 6.0.

3,907,524

VAPOR RECOVERY METHOD FOR CONTROLLING AIR POLLUTION

Harry William Haines, Jr., Houston, Tex., assignor to Emission Abatement, Inc.

Filed Dec. 13, 1973, Ser. No. 427,033
Int. Cl.[2] B01D *53/14*
U.S. Cl. 55—88 **5 Claims**



1. A process for recovery of vapors of volatile organic liquids from gases which comprises the steps of:

a. contacting in countercurrent flow the vapor containing gases with a sponge oil in an absorption tower having at least one theoretical equilibrium stage wherein the sponge oil has a true vapor pressure of less than about 10% of the true vapor pressure of the volatile organic liquid at the ambient temperatures;

b. flashing the absorbed vapors from the sponge oil;

c. recovering the flashed vapors; and

d. venting the gases substantially free of vapors of the volatile organic liquid to the atmosphere.

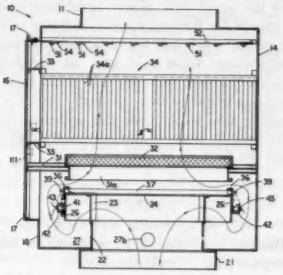
3,907,525

VENTILATING SYSTEM WASHER CLEANING APPARATUS

Donald E. King, Louisville, Ky., assignor to Ayr King Corporation, Louisville, Ky.

Filed July 12, 1973, Ser. No. 378,566
Int. Cl.[2] B03C *3/01*
U.S. Cl. 55—122 **2 Claims**

1. Apparatus for clearing grease vapors, odors, smoke and the like from enclosure ventilating systems having a power induced ventilating airstream discharged through an outlet mouth exterior of the enclosure, said apparatus comprising a generally tubular housing having one end providing an inlet passage and adapted to overlie and register with the outlet mouth of the ventilating system, the opposite end of said housing providing an outlet passage through which the cleansed ventilating airstream exits, said inlet and outlet passages being substantially in axial alignment, said housing having an inwardly turned flange at said inlet end completely encircling said inlet passage in the housing, said inlet passage being substantially smaller in cross section than the housing interior so that the housing sidewall and flange form a trough surrounding said inlet passage, a baffle plate overlying but spaced from said inwardly turned flange and having a peripheral skirt extending toward said trough whereby the direction of flow of said airstream is reversed and then redirected again toward the housing outlet as it flows around said skirt and out of said trough, electrostatic precipitator cells supported within said housing and disposed in said airstream downstream of said trough, and an array of nozzles supported on the down-



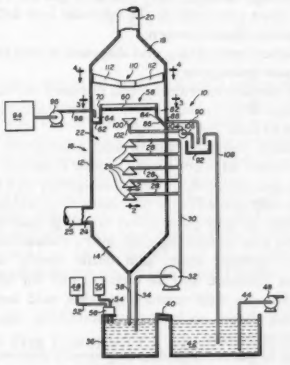
stream side of said baffle plate, said nozzles being positioned in spaced relation around the margin of the baffle plate and protruding slightly beyond said plate margin to deliver an axially directed spray of cold water in the annular space between the peripheral wall of the housing and said baffle skirt which intersects and flows substantially counter to the airstream as it flows between said skirt and said housing peripheral wall and prior to its movement past said precipitator cells.

3,907,526

HIGH VELOCITY SPRAY SCRUBBER

Abdus Saleem, Oakville, Canada, and Robert Kopita, Fanwood, N.J., assignors to Peabody Engineering Corporation, Stamford, Conn.

Filed Apr. 30, 1973, Ser. No. 355,928
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—223 **6 Claims**



1. In a scrubber conprising:

a peripherally continuous upwardly extending wall defining a substantially unobstructed scrubbing space therewithin, said wall having an inlet below said scrubbing space and an outlet thereabove;

a plurality of vertically spaced downwardly directed nozzles in said scrubber space, said nozzles being constructed to

spray into said scrubber space droplets of scrubber liquor having a minimum diameter of about 500 microns;

means for introducing gas to be scrubbed through said inlet and means for feeding scrubbing liquor to said nozzles, the relative velocity between the upwardly moving gas in said scrubbing space and said downwardly moving droplets of scrubber liquor being not less than about 600 feet per minute;

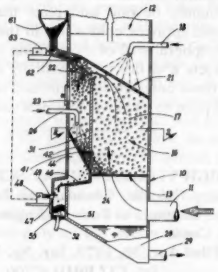
the improvement which comprises a wash tray disposed between the upper end of said scrubbing space and said outlet, means for flowing a layer of water over the upper surface of said wash tray for removing entrained droplets and particulates from said gas, an upwardly directed spray head disposed beneath said wash tray, and means for supplying water to said upwardly directed spray head for spraying said water onto the underside of said wash tray, whereby to prevent the formulation of mineral deposits on the bottom of said wash tray.

3,907,527

WET SCRUBBER APPARATUS

James H. Onnen, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 9, 1974, Ser. No. 468,555
Int. Cl. B01d *47/00*
U.S. Cl. 55—233 **5 Claims**



1. In an improved wet scrubbing apparatus for use in cleaning a gaseous fluid stream which comprises:

a flow through housing having a dirty gas inlet at one end and a clean gas outlet at the opposite end defining a gas passageway therebetween;

a first element restraining grid disposed across one extremity of said passageway;

a second element restraining grid disposed across the other extremity of said passageway, said restraining grids allowing gas to pass therethrough;

baffle means disposed within said passageway extending from a point adjacent to and spaced from the restraining grid at one extremity of said passageway to a point adjacent to and spaced from the restraining grid at the other extremity of said passageway dividing said passageway between said restraining grids into a contact zone and an element treating zone, said baffle means defining an element entrance and an element exit for said treating zone between said restraining grids, said treating zone including means to introduce scrubbing liquid to said treating zone; and

a plurality of gas contact elements loosely disposed between said restraining grids, said contact elements being of a density which allows them to be maintained in a buoyant state in said contact zone and directed into said treating zone as a consequence of a gas stream entering said dirty gas inlet and passing through said restraining grids;

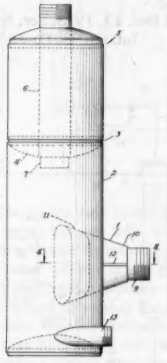
the improvements comprising an element removal means including a sloping surface disposed below said means to introduce said scrubbing liquid, said surface defining the lower extremity of said treating zone, said sloping surface having a diverging downwardly extending slot therein, said sloping surface merging with one of said restraining grids, said restraining grid defining the lower extremity of said contact zone, and a removal trough spaced from and disposed beneath said diverging slot.

3,907,528

WATER SEPARATOR SILENCER

Edmund John Halter, Irving, Tex., assignor to Burgess Industries Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,586
Int. Cl.² B01D *45/12*
U.S. Cl. 55—276 **3 Claims**



1. A combined water separator and silencer for treating a gaseous stream comprising a vertical cylindrical housing defining an empty separaring chamber and having an outlet at the top and a water discharge at the bottom of said chamber, an inlet transition horn having a circular inlet end and opposed broad sides tapering toward an oval discharge end secured to and opening tangentially into said separator chamber to discharge gases flowing therethrough as a sheet-like stream tangential throughout its width to the interior surface of said cylindrical housing, and a plurality of spaced flat splitters each being oriented substantially normal to the axis of said housing and extending between the opposed broad sides of said transition horn to divide the inlet passageway defined by said horn widthwise into a plurality of channels.

3,907,529

AIR CLEANING STRUCTURE

Lewis A. Borsheim, 504-31st Ave. North, Fargo, N. Dak. 58102

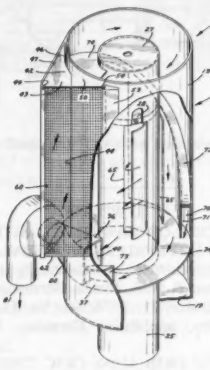
Continuation-in-part of Ser. No. 241,587, April 6, 1972, Pat. No. 3,792,573. This application Feb. 11, 1974, Ser. No. 441,284The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.
Int. Cl.² B01D *45/12;* **F02M** *35/022*
U.S. Cl. 55—337 **14 Claims**

1. An air cleaner removing entrained solids from an air stream and providing cleaned air comprising

a housing having a curved side wall forming a central chamber, said housing having top and bottom members,

air inlet means attached to said side wall and communicating with said central chamber, said air inlet means directing incoming air and the solids entrained therein tangentially into said housing and in cooperation with said side wall causing the removal of said entrained solids from said air,

an air conduit member within said housing offset from the center of said central chamber of said housing and having an air inlet receiving cleaned air from said central chamber and having air exit means for discharging said cleaned air thus received,



an enclosed duct located adjacent to the inner surface of said side wall forming said central chamber, said duct having an inlet receiving separated entrained solids from said incoming air and a discharge end discharging said entrained solids from said housing, and

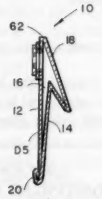
said duct decreasing in height from its inlet toward its discharge end.

3,907,530

VACUUM CLEANER FILTER BAG

John E. Fesco, South Hempstead, N.Y., assignor to Studley Paper Company, Inc., Inwood, N.Y.

Filed Nov. 19, 1973, Ser. No. 417,243
Int. Cl.² B01D *46/02*
U.S. Cl. 55—377 **3 Claims**



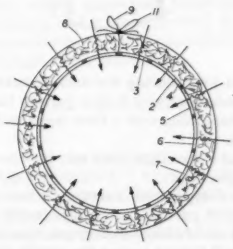
1. A vacuum cleaner filter bag comprising a blank sheet of air permeable material defining a front wall, a rear wall of substantially the same width as the front wall and a pair of opposing side walls, opposing edges of said blank being secured together in an overlapping relation to define a tube-like member, said opposing edges of said blank defining cooperating portions of said rear wall, said rear wall being substantially flat and having a thickness of said blank and having a double thickness of said blank only where said opposing edges are joined in an overlapping relation, said walls being joined at one end of the bag to define a portion having a narrow cross-section said front and rear walls diverging from each other in a direction away from said one end when the bag is expanded to define a substantially triangular cross-section at a longitudinal plane disposed normal to said front and rear walls; a top wall of substantially the same width as said rear wall connected to said front, rear and side walls at the other end of the bag, fold lines being provided in said rear and side walls to permit movement of the bag from a collapsed condition to an expanded condition and said top wall extending from a vertical to horizontal position, said rear wall being folded back upon itself in said collapsed condition with a portion of said rear wall being adjacent to said top wall and facing in a common direction with said top wall which is opposite to a direction in which said front wall faces, said top wall being substantially normally to the longitudinal length direction of the bag in said expanded condition, an upper fold line being provided between said top and front walls to permit angular movement of said top wall relative to said front wall when the bag moves from said collapsed condition to said expanded condition, and access means provided in said front wall adjacent to said upper fold line and directly in front of an inner surface portion of said top wall when in said collapsed condition for providing access to an interior of the bag to permit air directed through said access means to impinge on said inner surface portion of said top wall and urge unfolding of said rear wall as said top wall angularly moves relative to said front wall together with separation between said front and rear walls to move the bag to said expanded condition suitable for receiving waste material.

3,907,531

AIR FILTER FOR AN OIL BURNER

Merle D. Lee, and Lloyd R. Lee, both of Hackettstown, N.J., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 1, 1974, Ser. No. 511,094
Int. Cl.² B01D *46/00*
U.S. Cl. 55—491 **1 Claim**



1. An air filter for an oil burner having a substantially cylindrical air intake having a plurality of openings therein for drawing air into the oil burner, said air filter comprising

a strip of flexible air filtering material for cleaning air passing therethrough, said strip having spaced opposite ends with holes formed therethrough; and

spaced cords affixed to and extending from each of the ends of the strip adjacent the sides thereof, said cords passing through the holes through the strip, tying the strip around an air intake of an oil burner over the openings therein thereby filtering air drawn into the oil burner.

3,907,532

PROCESS FOR FORMING CATALYTIC AMORPHOUS GLASS FIBERS

Gordon J. Roberts, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 279,211, Aug. 9, 1972, Pat. No. 3,870,530. This application Dec. 12, 1974, Ser. No. 532,307
Int. Cl.² C03C *13/00*; **B01J** *11/32, 11/22*
U.S. Cl. 65—2 **4 Claims**

1. A process for forming catalytic, amorphous glass fibers effective at temperatures within the range of about 350°F to 700°F, two grams of said fibers having sufficient oxidative

catalytic activity to oxidize all of the CO to CO_2 in a supply gas consisting essentially of 1 percent CO, 3.75 percent air, balance nitrogen, at a flow rate of one liter per minute at 350°F comprising:

a. fiberizing a molten glass composition comprising from about 10 percent to about 70 percent by weight of an essentially binary metal oxide system and a balance of substantially inert glass-forming amorphous materials, said oxide system comprising at least 5 percent by weight of said glass composition of CuO and the balance of a metal oxide selected from the group consisting of MnO_2, Cr_2O_3, Fe_2O_3, CoO, NiO, V_2O_5, La_2O_3, CeO_2, ZrO_2, and mixtures thereof, and

b. cooling the resulting fibers at a sufficiently fast rate to obtain less than 10% crystallinity therein.

3,907,533

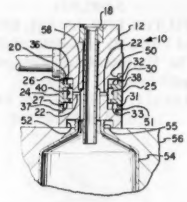
METHOD FOR REDUCING ENERGY IN THE EXHAUST GAS OF BLOWING GLASS

Charles W. Jenkins, 3456 Valleston Pky., Toledo, Ohio 43607

Division of Ser. No. 421,746, Dec. 5, 1973. This application Sept. 26, 1974, Ser. No. 509,695

Int. Cl.² C03B *23/00, 9/14*

U.S. Cl. 65—17 **1 Claim**



1. A method for reducing the noise generated by the exhaust of gas under pressure from a parison being blown into conforming relationship with a final shape mold, which comprises the steps of:

directing said exhaust gas from said parison through a plurality of openings;

reducing the energy of said exhaust gas from said parison by directing said gas onto an energy-absorbing material;

constraining said reduced energy gas to a tortuous path of travel to still further reduce the energy thereof; and

directing said reduced energy gas into the atmosphere.

3,907,534

METHOD AND APPARATUS FOR MAKING SURFACE TREATED GLASS CONTAINERS

Bo Ragnar Jonsson, Hammar; Gunnar Georg Toll, and Bo Torsten Krister Bodelind, both of Bohus, all of Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

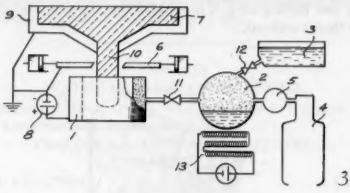
Continuation of Ser. No. 408,312, Oct. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 238,693, March 27, 1972, abandoned, which is a continuation of Ser. No. 49,229, June 24, 1970, abandoned. This application Oct. 3, 1974, Ser. No. 511,796

Claims priority, application Sweden, July 21, 1969, 10234/69

Int. Cl.² C03C *17/22;* **C03B** *9/00*

U.S. Cl. 65—30 **5 Claims**

1. The method of making a hollow glass container whose inner and outer surfaces have been treated, comprising the steps of extruding a string of glass at a temperature higher than the transformation temperature of the glass, accelerating particles in the gaseous state, said particles being ions selected from the group consisting of lithium, sodium, potassium and tin at least onto the circumferential surface of the string of glass at said temperature, cutting the string of glass into blanks, and subsequently shaping the blanks into hollow containers in such a way that the circumferential surface of the



string of glass becomes both the inner and outer surfaces of the container.

3,907,535

PROCESS OF MAKING A PARTIALLY CRYSTALLIZABLE SEAL

Gerd Muller, Mainz-Weisenau, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Mar. 21, 1974, Ser. No. 453,488

Claims priority, application Germany, Mar. 21, 1973, 2313993

Int. Cl.² C03B *32/00;* **C03C** *27/00, 3/22*

U.S. Cl. 65—33 **7 Claims**

1. In a process for soldering with a solder glass composition comprising a thermally devitrifiable solder glass and an inert refractory compound having a negative coefficient of thermal expansion, the improvement which comprises discontinuing the soldering before 50 percent of the total volume of said composition crystallizes, and wherein said composition consists essentially of:

a. a thermally devitrifiable solder glass having a softening point of about 300°–380° C, said solder glass having the following composition (in percent by weight):

Pbo	65 – 88
B_2O_3	7 – 20
SiO_2	0 – 10
Al_2O_3	0 – 8
Bi_2O_3	0 – 20
BaO	0 – 20
ZnO	0 – 5
total Bi_2O_3, BaO and ZnO	0 – 20

wherein up to 15 percent of the oxygen can be replaced by fluorine, and

b. beta-eucryptite, wherein the beta-eucryptite constitutes 5 – 30percent by weight and less than about two-thirds by volume of the total solder glass composition.

3,907,536

METHOD FOR DEPOSITING SILICA ON A FUSED SILICA TUBE

Claude Achener, Paris, France, assignor to Quartz & Silice, S.A., Paris, France

Filed Feb. 27, 1974, Ser. No. 446,464

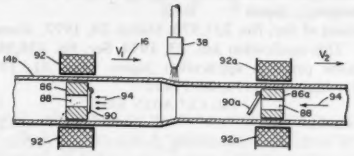
Claims priority, application France, Mar. 8, 1973, 73.08317

Int. Cl.² C03C *17/00;* **C03B** *21/00, 25/00*

U.S. Cl. 65—60 **9 Claims**

1. A method for continuously fabricating a tube of fused silica of high optical quality and predetermined dimensions comprising, in combination, the steps of advancing longitudinally a supply tube of fused silica, rotating axially the supply tube, heating a zone of the supply tube, depositing molten drops of silica on the outer surface of the heated zone by passing fine crystals of silica through a high temperature region proximate to the heated zone so that the drops fuse with the supply tube, generating a pressure difference between the interior and the exterior of the heated zone, with the interior pressure being greater than the exterior pressure, to maintain

the tube in an uncollapsed state and control its dimensions, drawing the heated zone by advancing the portions of the tube on opposite sides of the zone at differential rates, all of the foregoing steps being accomplished without the heated zone contacting a solid material so as to cause irregularities in the dimensions of said tube.



3,907,537

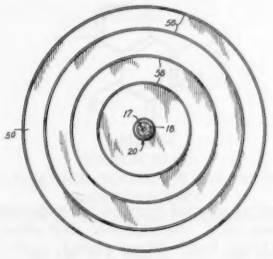
APPARATUS FOR PRODUCING GLASS SPHERES

Ib von Irgens-Bergh, Copenhagen, Denmark, assignor to Potters Industries, Inc., Carlstadt, N.J.

Filed Oct. 30, 1973, Ser. No. 411,159

Int. Cl.[2] C03B *19/10*

U.S. Cl. 65—142 **2 Claims**



1. Apparatus for producing spherical particles comprising, in combination:

means for supplying molten sphere-forming material;

conduit means including a discharge tube communicating with the supply means for providing a free falling molten stream of the material;

an open-top rotary receptacle for receiving the molten stream from the conduit means, the receptacle including an inner material-receiving surface extending in a plane perpendicular to the molten stream in close juxtaposition with the conduit means, an upstanding side wall around the material-receiving surface, an exterior cylindrical surface at least equal in height to the upstanding side wall, and a multiplicity of capillary orifices extending radially in a single plane from the side wall to the exterior cylindrical surface of the receptacle, each of the orifices having a cross-sectional area which is substantially equal to that of the spheres to be produced;

means for rotating the receptacle at a speed sufficient to maintain the molten material in continuous contact with at least a portion of the upstanding side wall, the molten material passing through the orifices and being discharged therefrom into the atmosphere under ambient temperature conditions to form a multiplicity of dispersed particles, the discharged particles passing through a space for a period of time sufficient to enable surface tension to shape the particles into spherical form; and

means for collecting the spheres in solid form at the end of their trajectory, the collecting means including a series of open-top cylindrical bins concentric with the rotational axis of the receptacle for receiving said spheres.

3,907,538

PROCESSES FOR PREVENTING THE FORMATION OF DEPOSITS ON THE INTERNAL WALLS OF ROTARY KILNS DURING THE PRODUCTION OF CITRATE-SOLUBLE ALKALI-METAL-CONTAINING PHOSPHATE FERTILIZERS

Ulrich Hauschild, Hannover, Germany, assignor to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Dec. 18, 1973, Ser. No. 425,784

Claims priority, application Germany, Dec. 22, 1972, 2262820

Int. Cl. C05b *13/06*

U.S. Cl. 71—34 **3 Claims**

1. A process for preventing the formation of deposits on the internal walls of flame-heated rotary kilns during the production of a citrate-soluble alkali-metal-containing phosphate fertilizer therein by calcination at a temperature between 900° and 1600°C of a mixture of (a) phosphate rock, (b) an alkali-metal carbonate, [alkali-metal phosphate,]a solution of an alkali-metal hydroxide, or a mixture of both, or an alkali-metal phosphate, or a mixture of phosphoric acid and an alkali-metal-oxide-supplying compound, [or a solution of an alkali-metal hydroxide,] and, when using an alkali-metal carbonate or a solution of an alkali-metal hydroxide, or both, (c) silica in an amount that is sufficient to bind as Ca_2SiO_4, all CaO that is present in the mixture that is in excess of the amount represented by the molecular ratio of 2 CaO:1 P_2O_5, which process comprises adding to the mixture before or during its passage through the kiln a magnesium compound selected from the group consisting of magnesium [carbonate] carbonates, magnesium [oxide] oxides, magnesium [hydroxide] hydroxides, magnesium silicates, and mixtures thereof, in an amount calculated as magnesium oxide that is equivalent to between 0.01 and 10% by weight of the dry mixture.

3,907,539

PROCESS FOR PRESERVING CUT FLOWERS USING 2-ROMO-2-NITROPROPANEDIOL-(1,3)

Bernd-Dieter Holdt, and Max-Heinz Sy, both of Dusseldorf, Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Continuation-in-part of Ser. No. 172,868, Aug. 18, 1971, abandoned. This application Apr. 17, 1974, Ser. No. 461,534

Claims priority, application Germany, Mar. 18, 1971, 2113209

Int. Cl.[2] A01N *3/02*

U.S. Cl. 71—68 **6 Claims**

1. An aqueous nutrient concentrate composition for preserving cut flowers consisting essentially of from 20 to 70 parts by weight of a sugar, from 0.2 to 3.0 parts by weight of acidic-reacting substances, said acidic-reacting substances being selected from the group consisting of aluminum sulfate, aluminum chloride, ammonium-aluminum sulfate, sodium-aluminum sulfate, potassium-aluminum sulfate, aluminum tartronate, aluminum formate, nickel chloride, zinc chloride, citric acid, tannic acid, tartaric acid, succinic acid, boric acid, sodium bisulfate, sodium bisulfite, acidic sodium phosphates, and the mixtures thereof from 0.01 to 1.0 parts by weight of 2-bromo-2-nitropropanediol-(1,3), from 0 to 0.1 parts by weight of plant growth promoting compounds, said plant growth promoting compounds being selected from the group consisting of β-indolylacetic acid, chlorochloline chloride, gibberellinic acid, α-naphthylacetic acid, and 2,4-dichlorophenoxyacetic acid, and the remainder to 100 parts by weight, of water.

3,907,540
HERBICIDAL COMPOSITION AND METHOD COMPLOYING 2-CHLOROETHANE-(THIONO)PHOSPHONIC ACID DERIVATIVES

Wolfgang Hofer, Wuppertal-Vohwinkel; Reinhard Schliebs, Cologne; Robert Rudolf Schmidt, Leverkusen, and Ludwig Eue, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

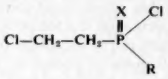
Division of Ser. No. 76,594, Sept. 29, 1970, Pat. No. 3,846,513. This application May 13, 1974, Ser. No. 469,574

Claims priority, application Germany, Oct. 4, 1969, 1950099

Int. Cl.² A01N 9/36

U.S. Cl. 71—86 **8 Claims**

1. Composition for regulating the growth of plants which composition comprises an agriculturally acceptable carrier and, in an amount sufficient to influence plant growth, a 2-Chloroethanephosphonic acid and 2-chloroethanethionophosphonic acid compound of the general formula



in which

X is oxygen or sulfur;

R is unsubstituted aryloxy or substituted aryloxy substituted with alkyl, hydroxy or nitro.

3,907,541
PYRIDAZONYLPHOSPHORIC ACID DERIVATIVES AS HERBICIDES

Jorg Bader, deceased, late of Arlesheim, Switzerland, and by Dagmar Bader-Ludwig, legal representative, Arlesheim, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

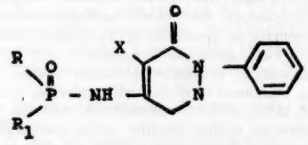
Division of Ser. No. 296,428, Oct. 10, 1972, Pat. No. 3,853,870. This application Sept. 26, 1974, Ser. No. 509,628

Claims priority, application Switzerland, Oct. 12, 1971, 14850/71

Int. Cl.² A01N 9/36

U.S. Cl. 71—86 **10 Claims**

1. A herbicidal agent for combating monocotyledonous and dicotyledonous weeds in cultures of crop plants, which, in addition to dispersing agents and/or other carriers, contains as active component an effective amount of a 1-phenyl-pyridazonylphosphoric acid derivative of the formula



wherein each of R and R_1 independently represents alkoxy of from 1 to 4 carbon atoms, alkylthio of from 1 to 4 carbon atoms, halogenoalkoxy of from 1 to 4 carbon atoms or alkenyloxy of 3 or 4 carbon atoms, or both together represent an oxyethyleneoxy bridge, and X represents chlorine or bromine.

3,907,542
METHOD OF STIMULATING PARTHENOCARPY IN PLANTS

Hideo Kano, Ibaraki; Masaru Ogata, Kobe, and Hisajiro Yukinaga, Kusatsu, all of Japan, assignors to Shionogi & Company,, Japan

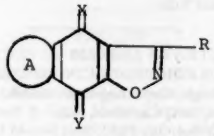
Division of Ser. No. 237,970, March 24, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,968

Claims priority, application Japan, Mar. 31, 1971, 46-19411; Mar. 31, 1971, 46-19412

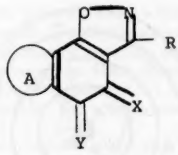
Int. Cl.² A01N 9/00

U.S. Cl. 71—88 **12 Claims**

1. A method for stimulating parthenocarpy in fruit bearing plants which comprises applying to said plants at the stage of flowering a parthenocarpy stimulating amount of a composition comprising as an active ingredient a compound selected from the group consisting of:



and



wherein

R is a member selected from the group consisting of halogen, lower alkyl, phenyl, lower alkyl phenyl, di-(lower alkyl)-phenyl, lower alkoxy phenyl, di-(lower alkoxy)-phenyl, hydroxyphenyl, halogenophenyl, dihalogenophenyl [di-(lower alkyl)-amino]-phenyl and halogeno-[di-(lower alkyl)-amino]-phenyl;

X and Y each are oxygen and

A is a condensed aromatic ring selected from the group consisting of benzene, lower alkylbenzene, di-(lower alkyl)-benzene, lower alkoxybenzene, di-(lower alkoxy)-benzene, hydroxybenzene, halogenobenzene and didhalogenobenzene.

3,907,543
4-AMINO-1,2,4-TRIAZINE-5-ONE NOVEL COMPOUNDS, A PROCESS FOR THEIR PRODUCTION AND HERBICIDAL COMPOSITIONS

Karlfried Dickore, Leverkusen; Wilfried Draber, Wuppertal-Elberfeld, and Ludwig Eue, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

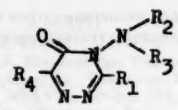
Division of Ser. No. 224,966, Feb. 9, 1972, Pat. No. 3,847,914. This application Oct. 29, 1973, Ser. No. 410,668

Claims priority, application Germany, Feb. 18, 1971, 2107757

Int. Cl.² A01N 9/22

U.S. Cl. 71—93 **31 Claims**

1. Herbicidal compositions comprising a herbicidally acceptable carrier and, as an active ingredient, from 0.1 to 95% of a 4-amino-1,2,4-triazine-5-one compound of the formula:



(I)

in which

R_1 and R_4, which may be the same or different, are hydrogen, alkyl of from 1 to 6 carbon atoms, trifluoromethyl, cycloalkyl of from 3 to 12 ring carbon atoms, phenyl, halophenyl, trifluoromethylphenyl, nitrophenyl, alkylthiophenyl, alkylsulfonylphenyl, cyanalkyl, alkoxyalkyl, alkylphenyl or alkoxyphenyl of from 1 to 4 carbon atoms in the alkyl or alkoxy moiety, or phenylalkyl of from 1 to 3 carbon atoms in the alkyl moiety,

R_2 is hydrogen or alkyl of from 1 to 4 carbon atoms; and

R_3 is hydrogen, alkyl from 1 to 4 carbon atoms, phenyl, haloalkyl, trifluoromethylalkyl, hydroxyalkyl, or phenylalkyl of from 1 to 3 carbon atoms in the alkyl moiety, or alkylphenyl, alkoxyphenyl or alkylmercaptophenyl of from 1 to 4 carbon atoms in the alkyl moiety.

3,907,544

HERBICIDAL 2-HALO-N-(CYCLICIMIDOALKYLENE)-SUBSTITUTED ACETANILIDES

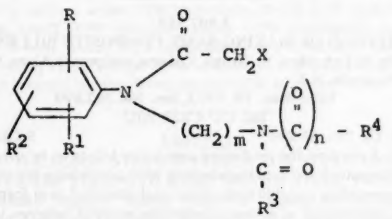
John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 148,892, June 1, 1971, Pat. No. 3,769,301. This application Sept. 24, 1973, Ser. No. 400,272

Int. Cl. A01n *9/22*

U.S. Cl. 71—95 **22 Claims**

1. A herbicidal composition comprising an adjuvant and an effective amount of a compound of the formula



wherein:

R and R^1 are hydrogen, alkyl or alkoxy having at least 1 and not more than 10 carbon atoms and can be like or unlike, R^2 is hydrogen, alkyl or alkoxy having at least 1 and not more than 10 carbon atoms, NO_2 or halogen and

R^3 and R^4 are combined to form an alkylene or alkenylene bridge having at least 2 and not more than 5 carbon atoms, or a phenylene group,

X is chlorine, bromine or iodine,

m is an integer of 1 or 2, and *n* is an integer of 0 to 2 inclusive.

3,907,545

STABLE LIQUID AMINE SALTS OF CHLORINATED HERBICIDAL ACIDS

Yog R. Dhingra, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1973, Ser. No. 356,527

Int. Cl. A01n *9/24*

U.S. Cl. 71—113 **9 Claims**

1. A stable liquid herbicide composition comprising in combination (a) dimethylamine, (b) from about 2 to about 7 pounds acid equivalent per gallon of a chlorinated herbicidal lower alkanoic acid, and (c) from about 10 to about 50 percent by weight of a solvent medium selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol, ethylene glycol methyl ether, diethylene glycol methyl ether, ethylene glycol n-butyl ether, propylene glycol methyl ether, methylene chloride, 1,1,2-trichloroethane, n-butyl ether, dimethylformamide, toluene, xylene, methylethyl ketone and glycerine, said amine being present in sufficient amounts to neutralize substantially all of the herbicidal acid present.

3,907,546

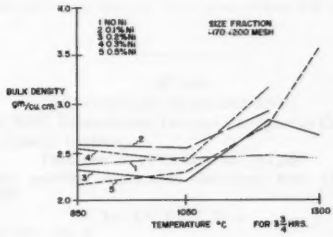
MOLYBDENUM FLAME SPRAY POWDER AND PROCESS

David J. Port, Athens, and Richard F. Cheney, Towanda, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 455,610, March 28, 1974, abandoned. This application Aug. 21, 1974, Ser. No. 499,139

Int. Cl.[2] B22F *1/02*

U.S. Cl. 75—0.5 AB **10 Claims**



1. A free flowing flame spray powder comprising agglomerates of powder particles, said agglomerates consisting essentially of subparticles of molybdenum and from 0 to 50 weight percent of a solid solution alloying element selected from the group consisting of tungsten, rhenium, chromium and the Group VIII elements, said subparticles at least partly coated with layers of nickel, at least a portion of the subparticles containing zones of diffused nickel atoms adjacent to at least a portion of the surface areas of contacts of the subparticles with the nickel layers, and at least a portion of the nickel layers containing diffused atoms from the subparticles, the total amount of nickel layers in the agglomerates being from 0.1 to 0.5 weight percent of the agglomerates.

3,907,547

METHOD OF PREPARING VACUUM-TREATED STEEL FOR MAKING INGOTS FOR FORGING

Hans Graf, Wattenscheid, and Harry Lutz, Bochum, both of Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Germany

Filed Mar. 22, 1974, Ser. No. 454,035

Claims priority, application Germany, Mar. 24, 1973, 2314843

Int. Cl.² C21C *7/10;* **C22C** *33/00*

U.S. Cl. 75—49 **8 Claims**

1. A process for preparing a vacuum-treated steel for making forging ingots of great weight and high purity as required for rotors, turbine shafts, inductor shafts, and other, usually annealed, large steel parts, which comprises:

A. Subjecting molten pig iron in a vessel to blowing with oxygen and and at least one slag which reduces the phosphorus content thereof to form a foremetal containing 0.10 to 1 weight percent carbon and less than 0.010 weight percent phosphorus, the foremetal having a temperature at the end of said blowing not exceeding 1650°C;

B. Separating said foremetal formed from step A from said slag and directing an oxygen down-blast onto the surface of said molten metal while maintaining it molten to raise the temperature thereof to a temperature of greater than 1700°C;

C. Simultaneous to said oxygen down-blast, injecting a gas mixture of oxygen and inert gas into said molten metal through at least one laterally disposed gas inlet terminating in a nozzle, the amount of gas being sufficient only to keep the nozzle free of said metal;

D. After said molten metal has reached a temperature in excess of 1700°C, discontinuing said oxygen down-blast;

E. Introducing an alloying component to said foremetal and increasing the injection of oxygen and inert gas to said molten metal;

F. Thereafter adding reducing agent to said molten metal;

G. Adding a sufficient amount of a desulfurizing agent to said molten metal to reduce the sulfur content to less than 0.010 weight percent and introducing to said molten metal an inert gas; and

H. Subjecting said molten metal to at least one vacuum treatment and teeming said molten metal.

3,907,548

PROCESS FOR THE PRODUCTION OF STEELS HAVING HIGH CHROMIUM CONTENT AND LOWEST POSSIBLE CARBON CONTENT

Eberhard Steinmetz, and Jurgen Berve, both of Bochum, Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Germany

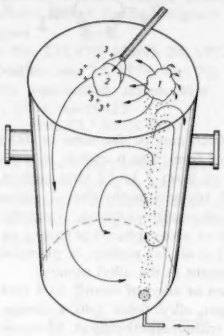
Filed June 25, 1974, Ser. No. 482,958

Claims priority, application Germany, July 4, 1973, 2333937

Int. Cl.² C21C *7/00;* **C22C** *33/00*

U.S. Cl. 75—51 **12 Claims**

1. In a process for removing carbon from a chromium-containing molten steel wherein an unidirection flowing stream was maintained within a bath of molten steel by the injection in such molten steel of the gaseous oxidizing stream the improvement for retaining high chromium content in the final refined steel while minimizing carbon content therein which comprises introducing a reducing agent in said unidirectionally flow stream at a point downstream of the point wherein said gaseous oxidizing stream contacts said moltent steel.



3,907,549

METHOD OF REFINING IN IMPROVED Q-BOP VESSEL

Andre H. Brisse, Pittsburgh, and David K. Griffiths, Penn Hills Twp., Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 284,693, Aug. 29, 1972, Pat. No. 3,802,685. This application Dec. 5, 1973, Ser. No. 421,883

Int. Cl.² C21C *5/34, 7/00*

U.S. Cl. 75—60 **1 Claim**

1. A method of refining a bath of molten metal in a Q-BOp steelmaking vessel comprising:

introducing oxygen through generally upstanding tuyeres in the bottom of the vessel having a hydraulic diameter from 1/25 to 1/13 of the bath depth and having a total cross-sectional area of all such tuyeres in square centimeters from one to three times the bath size in metric tons at a minimum rate of about 85 Nm^3/hour/square centimeter of tuyere cross-section at a minimum pressure of 1 atmosphere to the molten metal bath contained in said vessel; and

maintaining the oxygen pressure between from 1 to 15 atmospheres for a sufficient period of time to refine said molten metal bath.

3,907,550

METHOD OF MAKING SAME COMPOSITE BILLETS

Philip R. Critchlow, St. Bruno, Canada, assignor to Airco, Inc., Montvale, N.J.

Filed Mar. 19, 1973, Ser. No. 342,899

Int. Cl.² C22B *9/02*

U.S. Cl. 75—65 ZM **9 Claims**

1. A method for producing composite billets to be used as starting stock for superconducting wire comprising the steps:

a. suspending metallic rods of material classified as or forming one component of a superconducting material between inert caps so as to form an assembly;

b. lowering said assembly into a molten bath of normal material so as to totally encase said rods;

c. allowing said bath to solidify thereby forming a cast composite billet; and

d. zone-melting said billet in an inert atmosphere by progressively heating the billet along its length until the entire billet is progressively remelted in segments to a maximum temperature exceeding the melting temperature of said normal material at which wetting takes place between said normal material and said rods, thereby providing a cast billet with improved adherence between said rods and said normal material.

3,907,551

CORROSION RESISTANT AUSTENITIC STEEL

Albert G. Hartline, III, Brackenridge, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1973, Ser. No. 355,394
Int. Cl. C22c *39/14, 39/26*
U.S. Cl. 75—122 7 Claims

1. An alloy consisting essentiall of about 15–45% manganese, about 10–30% chromium, about 1–3% copper, about 0.85–3% nitrogen, about 0–1% carbon, about 0–2% silicon and the balance iron and residuals wherein the composition is such that:

$$(1) \quad \frac{30(\%C + \%N) + 0.5(\%Mn)}{\%Cr + 1.5(\%Si)} \geqq 1.5$$

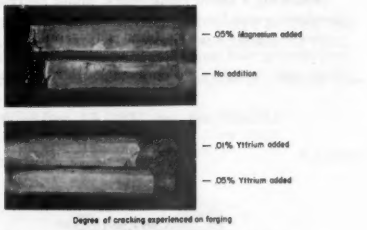
$$(2) \quad \%Cr + 0.8(\%Mn) - 11.88(\%N - 0.1) - (28.5 + \%Cu) \geqq 0$$

3,907,552

NICKEL BASE ALLOYS OF IMPROVED PROPERTIES

Richard L. Kennedy, Monroe, N.C., assignor to Teledyne, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 188,260, Oct. 12, 1971, abandoned. This application Mar. 16, 1973, Ser. No. 342,074
Int. Cl. C22c *19/00*
U.S. Cl. 75—122 14 Claims



1. A nickel base alloy of improved characteristics in at least one of stress rupture properties and hot workability, said alloy having a nominal composition consisting essentially of about 0.04% carbon, about 19% chromium, about 3.1% molybdenum, about 0.9% titanium, about 0.5% aluminum, about 18.5% iron, about 5.2% columbium, and a balance that is essentially nickel except for an addition in said alloy of yttrium in an amount ranging from about 0.02% to about 0.15%.

3,907,553

HIGH-CARBON STEEL SUITABLE FOR SUPER HIGH TENSILE STRENGTH HARD DRAWN STEEL WIRE

Michihiko Nagumo, Tokyo; Shigehiro Yamaguchi, Fujisawa, and Toshihiko Takahashi, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Dec. 6, 1972, Ser. No. 312,727
Claims priority, application Japan, Dec. 6, 1971, 46-97840
Int. Cl.[2] C21D *9/52;* C22C *38/26, 38/28, 38/30*
U.S. Cl. 75—126 D 1 Claim

1. A super high strength steel wire having excellent heat treating ability consisting essentially of 0.75 –1.0% of carbon, not more than 0.5% of silicon, 0.1 to 1.0% of manganese, 1.0 to 5.0% of chromium, and a metal selected from the group consisting of 1 to 4% of cobalt, 0.01 to 0.2% of niobium, 0.001 to 0.0 titanium, 0.01 to 0.3% of vanadium and not more than 0.1% of aluminum with the balance being iron and unavoidable impurities.

3,907,554

ADDITIVE FOR STEEL BATHS

Kenneth Joseph Boaden, Rectory Rd., Orsett, Essex, and Brian John Edmondson, 51 Berkeley Dr., Hornchurch, Essex, both of England

Filed June 17, 1974, Ser. No. 480,155
Claims priority, application United Kingdom, June 15, 1973, 28568/73
Int. Cl.[2] C22C *33/00, 27/04*
U.S. Cl. 75—129 13 Claims

1. An additive for molten steel baths which consists essentially of a porous, solid-shaped composition having the property of ready dissolution at the interface between the molten metal and molten slag layer and having by weight, a molybdenum content in the range 40 to 95%, an iron content in the range 10 to 50%, a carbon content in the range 0.2 to 5% and as a binder a member of the group consisting of molasses, starch, dextrine and tar, the density of the composition being in the range 2.5 to 5 grams per cubic centimeter.

3,907,555

NICKEL ALLOYS

Ronald P. Dudek, River Grove; Peter Kosmos, Alsip, and John A. Tesk, Wood-Ridge, all of Ill., assignors to Howmedica, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 317,594, Dec. 22, 1972, Pat. No. 3,841,868. This application Sept. 26, 1974, Ser. No. 509,557
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 7 Claims

1. A corrosion resistant hot workable and hardenable precision casting alloy consisting essentially, by weight:

Nickel	at least 60%
Chromium	10 – 25%
Molybdenum	0 – 10%
Manganese	0.50 – 1.50
Tin	0 – 6.5
Gallium	1.0 – 7.5
Copper	0 – 5.0
Silicon	0 – 4.0
Aluminum	0 – 2.0
Cobalt	0 – 5.0
Carbon	0 – 0.2

the combined total amount of tin and gallium not exceedng 7.5.

3,907,556

ALLOYS FOR TENSION BANDS

Karl H. Reiff, Tennenbronn, Germany, assignor to Carl Haas, Schramberg, Germany

Filed Feb. 9, 1973, Ser. No. 331,007
Claims priority, application Germany, Feb. 11, 1972, 2206397
Int. Cl.[2] C22C *5/04*
U.S. Cl. 75—172 R 1 Claim

1. A low modulus of torsion, high quality factor taut strip for measuring instruments, said taut strip being formed of an alloy which consists essentially of 80 percent by weight palladium, 10 percent by weight gallium, and 10 percent by weight copper, and the quality factor Z of the taut strip is 3.73.

3,907,557

PRESSURE-SENSITIVE ELECTROSTATIC IMAGING LABELS

William J. Bolduc, Jr., Glendora, Calif., assignor to Avery Products Corporation, San Marino, Calif.

Continuation-in-part of Ser. No. 113,762, Feb. 8, 1971, abandoned. This application May 29, 1973, Ser. No. 364,288
Int. Cl. G03g *5/02;* B32b *7/06;* G09f *3/00*
U.S. Cl. 96—1.5 22 Claims

1. A multi-ply electrostatic imaging construction for pres-

sure-sensitive labels and label stock comprising a composite laminate of:

a. an electrostatic imaging face material comprised of an electrostatic imaging surface and a support for the electrostatic imaging surface;

b. a pressure-sensitive adhesive interlayer of a thickness of from about 0.25 to about 2.0 mils in adhesive contact with said support; and

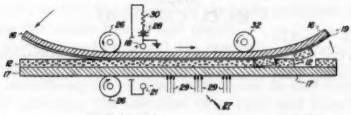
c. a release liner comprising a release coating in contact with said pressure-sensitive adhesive interlayer and a paper base containing at least one electroconductive agent, the paper in said composite laminate having moisture content of from about 2 to about 12 percent by weight and said composite laminate having, within said range of moisture content, a volume resistivity, in ohm-cm, greater than the volume resistivity of the electrostatic imaging face material.

3,907,558

MANIFOLD IMAGING UTILIZING SILICA GEL ACTIVATING LAYER

Joseph M. Kropac, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1973, Ser. No. 429,251
Int. Cl.² G03B *5/00*; **G03G** *5/04, 1/48*
U.S. Cl. 96—1 M **20 Claims**



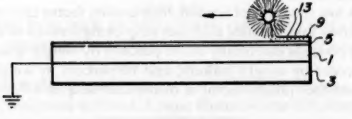
1. In a manifold imaging member comprising a donor layer, receiver layer, an electrically photosensitive imaging layer and an activator layer, the improvement wherein said activator layer is in the form of a gel comprising a finely divided hydrophobic silica and a liquid activator for said imaging layer.

3,907,559

IMAGING PROCESS EMPLOYING FRICTION CHARGING IN THE PRESENCE OF AN ELECTRICALLY INSULATING DEVELOPER LIQUID

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 863,664, Oct. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 553,438, May 27, 1966, abandoned. This application Mar. 14, 1973, Ser. No. 341,217
Int. Cl.² G03G *13/02, 13/10*
U.S. Cl. 96—1.3 **15 Claims**



1. A method for forming a visible image comprising the steps of:

a. providing a photoconductive insulating layer on an electrically conductive substrate;

b. friction charging said photoconductive insulating layer with a second material in the presence of an electrically insulating developer liquid until an electrostatic charge is produced on said photoconductive insulating layer, said second material differing in triboelectric character from said photoconductive insulating layer; and

c. exposing said photoconductive insulating layer to an imagewise pattern of radiation to which the layer is sensitive

whereby a visible image is formed.

3,907,560

ELECTROPHOTOGRAPHIC REPRODUCTION SYSTEM UTILIZING ION MODULATOR AND DIELECTRIC AND DIELECTRIC IMAGING SURFACE

Harvey J. Sable, Cleveland, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 27, 1974, Ser. No. 455,206
Int. Cl.² G03G *13/14, 5/04*
U.S. Cl. 96—1.4 **11 Claims**

1. A process for electrophotographic reproduction which comprises

imparting a uniform electrostatic charge to a photoconductive ion modulator,

exposing the charged ion modulator to a pattern of light and shadow corresponding to an original image which is to be reproduced, thereby producing a latent electrostatic image thereon,

passing ions through the ion modulator carrying said latent electrostatic image to selectively impinge upon a barrier type aluminum oxide on aluminum surface, whereby producing a latent electrostatic image thereon,

developing said latent electrostatic image with toner particles to produce a toned image thereon,

transferring said toned image to a receiving material and fixing said toned image upon said receiving material.

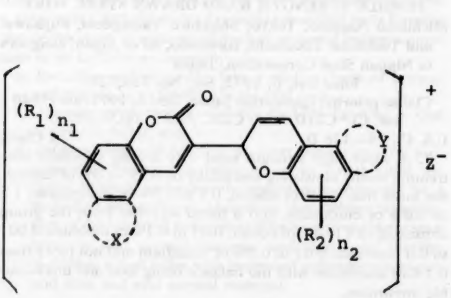
3,907,561

PYRONYL-PYRYLIUM SENSITIZERS FOR ELECTROPHOTOGRAPHIC ORGANIC PHOTOCONDUCTORS

Tomio Kubota, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Oct. 4, 1973, Ser. No. 403,402
Claims priority, application Japan, Oct. 6, 1972, 47-100799; Oct. 6, 1972, 47-100800; Oct. 6, 1972, 47-100801
Int. Cl.² G03G *5/06*
U.S. Cl. 96—1.6 **26 Claims**

1. A sensitized photoconductive composition comprising a polymeric organic photoconductor together with from 0.2 to 1.0% by weight based on the weight of the photoconductor of a sensitizer having the formula:



wherein each of R_1 and R_2 represents a radical selected from the group consisting of hydrogen, alkyl having 1 – 2 carbon atoms, alkoxy having 1 – 2 carbon atoms, halogen and nitro, each of n_1 and n_2 represents an integer from 1 to 2 in the case where said R_1 and R_2 represent a radical other than hydrogen, each of X and Y, when present represent a fused phenyl nucleus having at most two substituents selected from the group defined for said R_1 and R_2, and Z^- represents anionic functional group.

3,907,562
PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS

Richard G. Crystal, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

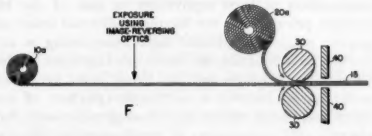
Filed Nov. 14, 1973, Ser. No. 415,842
Int. Cl.² G03G *13/00*
U.S. Cl. 96—1.8 **12 Claims**

1. A process of preparing a waterless lithographic master comprising depositing a hydrophobic particulate image pattern on a suitable substrate, fusing said pattern to said substrate, coating said substrate, with a thermally curable but non-water curable aqueous silicone gum emulsion or an aqueous silicone elastomer emulsion and heating said silicone to selectively provide ink-receptive image areas and ink-repellent non-image areas.

3,907,563
DIFFUSION TRANSFER PROCESS USING PROCESSING COMPOSITION IMPREGNATED IMAGE-RECEIVING ELEMENT

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 13, 1973, Ser. No. 424,213
Int. Cl.² G03C *7/00, 5/54, 1/40, 3/02*
U.S. Cl. 96—3 **9 Claims**



1. A diffusion transfer process comprising the steps of exposing a photosensitive silver halide element comprising a support carrying at least one photosensitive silver halide layer, each said silver halide layer having associated therewith an image dye-providing material, bringing said exposed photosensitive element into contact in the dark with the liquid-impregnated outer layer of a processing liquid-impregnated image-receiving element comprising an alkali-impermeable transparent support carrying, in sequence, an image-receiving layer, a light-reflecting layer and an opaque layer, said contact being effected under pressure sufficient to obtain surface-to-surface wet contact to form a laminate, with said supports outermost, whereby a quantity of said liquid sufficient to process said exposed photosensitive element is absorbed by said exposed photosensitive element from said liquid-impregnated image-receiving element thereby (a) developing said exposed photosensitive element, (b) forming an imagewise distribution of a diffusible image dye-providing material as a function of said development, and (c) transferring at least a portion of said imagewise distribution of said diffusible image dye-providing material through said opaque layer and said pigmented white layer to said image-receiving layer to form a transfer dye image viewable through said transparent support against said white pigmented layer without separating said superposed elements, and advancing said laminate from said dark area to a lighted area prior to completion of said transfer dye image, an opaque layer in said photosensitive element and said opaque layer in said image-receiving element being effective to prevent further exposure of said photosensitive silver halide.

3,907,564
PREPARING LITHOGRAPHIC PLATES UTILIZING HYDROLYZABLE MERCAPTO-SILANE COMPOUNDS

Harold Boardman, Chadds Ford, Pa., and Richard L. Wagner, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed June 27, 1974, Ser. No. 483,845
Int. Cl.² G03F *7/02*
U.S. Cl. 96—33 **7 Claims**

1. A process for preparing a lithographic printing plate which comprises the following steps:

a. photografting imagewise to an unsaturated oleophilic organic polymer substrate a hydrolyzable mercapto-silane compound having the general formula

$$(X)_a—\overset{(T)_b}{\underset{|}{Si}}—(R—SH)_c$$

where R is an organic radical, X is selected from mono and dialkyl amino, alkyl and aryl amido, alkoxy, aryloxy and alkyl and aryl oxycarbonyl radicals; T is selected from alkyl, cycloalkyl, aryl, alkaryl, aralkyl radicals and the corresponding halogenated radicals; a is an integer from 1 to 3; b is an integer from 0 to 2; c is an integer from 1 to 3; and $a+b+c$ equals 4;

b. washing away non-photografted mercapto-silane compound from unexposed areas; and

c. amplifying the hydrophilicity of the hydrolyzed silane groups by treating with at least one amplifying agent selected from soluble silicate solutions and colloidal silica dispersions.

3,907,565
PROCESS FOR MANUFACTURING DOMED SPIRAL ANTENNAS

Bernard Lee Burton, Simi; Minoru Takaki, Arleta, and Roger D. Hall, Encino, all of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.

Filed Dec. 26, 1973, Ser. No. 427,748
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36.2 **10 Claims**

1. A process for manufacturing a domed spiral high frequency antenna comprising the steps of:

forming a thin shell domed substrate of reinforced polymeric material,

forming a sheet of metal foil over a die to essentially the configuration of the substrate,

placing a layer of epoxy cement on one side of one of said substrate and said foil,

placing said foil over said substrate and subjecting the composite to heat and pressure to bond said substrate and said foil together,

coating said foil with a layer of photo-resist material,

placing a photo negative of the desired spiral pattern between said coated foil layer and a source of collimated light and exposing said layer to said light source for a desired period,

developing said photo-resist layer and rinsing away the unexposed photo-resist material,

etching away the unprotected foil layer to leave the desired spiral pattern, and

removing the remaining photo-resist material.

3,907,566

PHOTOSENSITIVE MATERIAL CONTAINING INORGANIC COMPOUND COATED METAL PARTICLES AND THE USE THEREOF IN PHOTOGRAPHIC DEVELOPMENT PROCESSES

Eiichi Inoue, Tokyo; Isamu Shimizu, Fuchu; Hiraku Sakuma, Musashino, and Hiroshi Kokado, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 20, 1972, Ser. No. 273,407
Claims priority, application Japan, July 23, 1971, 46-55111
Int. Cl. G03c *1/00, 5/24*
U.S. Cl. 96—48 R 10 Claims

1. A photosensitive member useful for providing a member having an image pattern by utilizing diffusion of a metal upon exposure to light into an inorganic compound capable of photooxidizing the metal, which comprises a photosensitive layer uniformly containing photosensitive particles comprising the metal coated on the surface of particles of the inorganic compound, the photosensitive particles ranging in size from 0.01 to 20 microns and having the metal in the ratio of 0.01–50 parts by weight per 100 parts by weight of the inorganic compound, the metal being selected from the group consisting of Ag, Cu, and alloys containing Ag, Cu or both of Ag and Cu, and the inorganic compound being selected from the group consisting of a chalcogen glass, which contains a sulfur family element selected from the group consisting of S, Se and Te in the form of glass, and a crystallized metal compound, which includes CuI, PbI_2, $PbCl_2$, $CdCl_2$, CuCl, SbI_3, PbS and PbSe.

2. A method for the production of an image pattern having metal-diffused portions at exposed areas, which comprises imagewise exposing a photosensitive member which comprises a photosensitive layer uniformly containing photosensitive particles, said particles comprising a particulate inorganic compound having a surface coating of a metal, said photosensitive particle ranging in size from 0.01 to 20 microns and having the metal in the ratio of 0.01–50 parts by weight to 100 parts by weight of the inorganic compound, the metal being selected from the group consisting of Ag, Cu, and alloys containing Ag, Cu or both of Ag and Cu, and the inorganic compound being selected from the group consisting of a chalcogen glass, which contains a sulfur family element selected from the group of S, Se and Te in the form of glass, and a crystallized metal compound, which includes CuI, PbI_2, $CdCl_2$, CuCl, SbI_3, PbS and PbSe.

3,907,567

WAXY CRAYON OR INK-LIKE DIAZOTYPE DEVELOPER COMPOSITION COMPRISING HEAT TRANSFERRABLE AZO COUPLER AND TRANSFER PROMOTOR

Kouzi Nihyakumen; Toshihiro Kouchi, both of Hirakata; Taizo Yokoyama, Osaka; Yasuo Ueda, Kobe; Yasutoki Kamezawa, Hirakata, and Tatsuo Aizawa, Kuwatsu-machi, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Continuation of Ser. No. 139,442, May 3, 1971, abandoned.
This application Jan. 17, 1974, Ser. No. 434,139
Claims priority, application Japan, May 1, 1970, 45-36851
Int. Cl.² G03C *5/34*
U.S. Cl. 96—49 19 Claims

1. A waxy color former composition of crayon stick-like form or a chalk-like form for treating the back surface of an original in diazo-type multicolor reproduction, which consists essentially of

a. a thermovolatile or thermosublimable azo coupler; and
b. a solid organic thermosublimable compound selected from the group consisting of camphor, naphthalene, bornane, menthol, and p-dichlorobenzene,

said components (*a*) and (*b*) dispersed in a wax.

13. An ink-like color former composition for treating the back surface of an original in the diazo-type multicolor reproduction, which consists essentially of

a. 5.0–40.0% by weight of a thermovolatile or thermosublimable azo coupler;
b. 5.0–30.0% by weight of a solid organic thermosublimable compound selected from the group consisting of camphor, naphthalene, bornane, menthol, and p-dichlorobenzene;
c. 0–0.3% by weight of a color material; and
d. 0–5.0% by weight of a resinous binder, said components (*a*), (*b*), (*c*) and (*d*) dispersed in a dispersion medium selected from aliphatic alcohols, aromatic solvents and neutral liquids containing OH groups, said dispersion medium boiling at 100°–250°C.

3,907,568

PROCESS FOR REGENERATING BLIXING SOLUTION FOR COLOR PHOTOGRAPHIC PROCESSING

Kazuo Shirasu; Sachio Matsushita; Tadao Hatano, and Haruhiko Iwano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Oct. 18, 1972, Ser. No. 298,712
Claims priority, application Japan, Oct. 22, 1971, 46-83790
Int. Cl.² G03C *1/32, 5/26*
U.S. Cl. 96—60 BF 14 Claims

1. In the blixing of color photographic materials using a blixing solution, an improved process of regenerating used blixing solution which comprises:

maintaining the silver salt concentration, expressed in terms of the amount of silver ions, at level less than about 10g/liter in the blixing solution and thereafter adding components to the used blixing solution to make up for those in the blixing processing without removing silver salt from the used blixing solution, thereby providing a composition at least equivalent to that of the blixing solution prior to use for blixing additional color photographic materials, wherein said maintaining is accomplished by subjecting the color photographic materials, after color development, to fixing prior to blixing to preliminarily remove a substantial portion of soluble silver salt from the color photographic materials or wherein said maintaining of the amount of silver salt is obtained by reducing the amount of coated silver in the initial color photographic materials to below 2.0g/m².

3,907,569

ULTRAVIOLET HOLDBACK OF NONSILVER PHOTOSENSITIVE SYSTEMS BY INCORPORATING THEREIN CERTAIN ORGANIC ADDITIVES

Andrew C. Hazy, Mentor; John E. Shirey, Bedford, and Lothar Ramins, Middlefield, all of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Jan. 31, 1973, Ser. No. 328,428
Int. Cl.² G03C *1/52*
U.S. Cl. 96—90 R 9 Claims

1. In a non-silver photosensitive composition comprising: (1) at least one color forming compound represented by the general formula

wherein each of R and R_2 is a monovalent radical represented by the formula

in which Z is selected from the group consisting of phenyl, naphthyl, and diphenyl and each of A and B is selected from the group consisting of H and alkyl; and each of R_3 and R_4 is selected from the group consisting of H, alkyl and aryl; and

2. at least one activator for said color forming compound, said activator being selected from the group consisting of (a) organic halogen compounds represented by the general formula Q—C—Hal_3 wherein Q is selected from the group consisting of H, Cl, Br, I, alkyl, substituted alkyl, aryl, substituted aryl, aroyl, and arylalkyl; and each Hal represents a halogen atom selected from the group consisting of Cl, Br or I; (b) sulfur containing compounds represented by either R—SH or R—S—S—R wherein each R represents an aryl or heterocyclic ring; and (c) compounds containing both halogen and sulfur selected from the group consisting of sulfonyl and sulfenyl halides; the improvement which consists in the incorporation in said composition of (3) at least one organic compound which produces imagery having improved ultraviolet holdback, said compound being selected from the group consisting of heterocyclic compounds selected from the group consisting of acridine, phenothiazine, acridan, carbazole, N-vinylcarbazole, and benzolflavine; quinone compounds selected from the group consisting of naphthoquinones and 9,10 anthraquinones; and multifunctional aromatic hydroxy compounds selected from the group consisting of 1,2,4-trihydroxybenzene and 1,4,9,10-tetrahydroxy-9,10-dihydroanthracene.

3,907,570
PHOTOSENSITIVE MATERIAL COMPRISING A FURFURYLIDENE, A LOWER HALOALKANE AND POLY-N-VINYL CARBAZOLE

Susan P. Robie, Gorham, Maine, assignor to Scott Paper Company, Philadelphia, Pa.

Filed Mar. 19, 1974, Ser. No. 452,596
Int. Cl.² G03C *1/52*
U.S. Cl. 96—90 R **1 Claim**

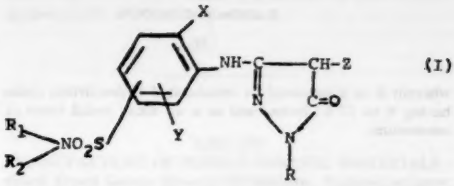
1. A heat-developable photographic plate comprising, on a support, a layer containing: as a color former, a purified furfurylidene compound; as a sensitizer, a photosensitive lower haloalkane; and, as a color enhancer and binder, poly-N-vinyl carbazole.

3,907,571
MAGENTA COUPLER-CONTAINING SILVER HALIDE PHOTOGRAPHIC MATERIALS

Atsuaki Arai; Yasushi Oishi; Akio Okumura; Minoru Yamada; Yukio Yokota, and Kozo Inouye, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Nov. 13, 1973, Ser. No. 415,864
Claims priority, application Japan, Nov. 15, 1972, 47-114445
Int. Cl.² G03C *1/40*
U.S. Cl. 96—100 **17 Claims**

1. A silver halide photographic emulsion containing at least one 3-anilino-2-pyrazol-5-one type nondiffusing magenta coupler of the following formula (I):



(I)

wherein said sulfamoyl group is in the meta- or para-position, R represents an aryl group or a heterocyclic group selected from the group consisting of a 2-thiazolyl, a 2-benzothiazolyl, a 2-benzoxazoly, a 2-oxazolyl, a 2-imidazolyl or a 2-benzimidazolyl group; R_1 and R_2 each represents a hydrogen atom or an alkyl group, an aryl group, or a heterocyclic group selected from the group consisting of a benzimidazolyl group or a benzothiazolyl group or a group of non-metallic atoms necessary for forming a heterocyclic group together with the N-atom of the sulfamoyl group selected from the group consisting of a morpholine or piperidine ring; X and Y each represents an alkyl group, an aryl group, alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an amino group, an amido group, a hydroxy group, a cyano group, a nitro group or a halogen atom and Y additionally represents a hydrogen atom; and Z represents a hydrogen atom or a coupling removable residue which can be removed by coupling with an oxidation product of a primary aromatic amino developing agent.

3,907,572
COLOR PHOTOGRAPHIC PHOTOSENSITIVE EMULSION AND COLOR PHOTOGRAPHIC MATERIAL

Bunzo Ueda; Sigeru Iguchi; Tetsuo Yano, and Tamotu Iwata, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Filed Jan. 25, 1974, Ser. No. 436,790
Claims priority, application Japan, Jan. 30, 1973, 48-12306
Int. Cl.² G03C *1/40, 1/72*
U.S. Cl. 96—100 **10 Claims**

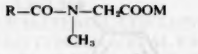
1. In a color photographic silver halide emulsion which comprises silver halide and a coupler, the improvement of additionally including in said emulsion a polymer which contains as side chain groups (a) carboxyl groups, (b) imidazole groups, and (c) amide groups or side chain groups (a), (b) and (c) and also (d) N-(1,1-dimethyl-3-oxobutyl) aminocarbonyl groups, the proportions of said groups being (a) 1–20 mol %, (b) 1–20 mol %, (c) 10–98 mol % and (d) 0–50 mol %, said polymer being a terpolymer of (1) acrylic acid, (2) acrylamide and (3) a vinyl imidazole or being a tetrapolymer of (1), (2), (3) and also (4) diacetone acrylamide.

3,907,573
SILVER HALIDE PHOTOGRAPHIC EMULSIONS WITH IMPROVED PHYSICAL CHARACTERISTICS

Simone Franco, Cuneo; Marcello Puccini, and Angelo Vallarino, both of Savona, all of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 174,269, Aug. 23, 1971, abandoned. This application Mar. 11, 1974, Ser. No. 449,606
Claims priority, application Italy, Aug. 21, 1970, 52966/70
Int. Cl.² G03C *1/04*
U.S. Cl. 96—114 **9 Claims**

1. A silver halide photographic emulsion which includes, as a binder, a mixture of gelatin and at least a water-insoluble dispersed polymer, said polymer having been prepared by emulsion polymerization of ethylenically unsaturated monomers in the presence of a dispersant of the general formula



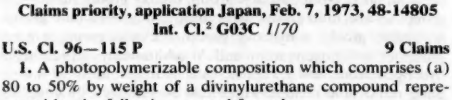
wherein R is a saturated or unsaturated hydrocarbon chain having 8 to 17 C atoms, and m is an alkali metal atom or ammonium.

3,907,574
PHOTOPOLYMERIZABLE COMPOSITION

Teruhiko Yonezawa, and Nobuyuki Kita, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Feb. 7, 1974, Ser. No. 440,609
Claims priority, application Japan, Feb. 7, 1973, 48-14805
Int. Cl.² G03C *1/70*
U.S. Cl. 96—115 P **9 Claims**

1. A photopolymerizable composition which comprises (a) 80 to 50% by weight of a divinylurethane compound represented by the following general formula



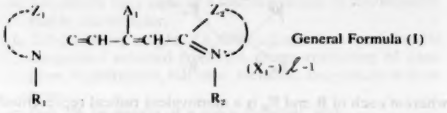
in which R_1, R_2 and R_3 each represents a hydrogen atom or a methyl group, n represents 1, 2 or 3, A represents a divalent residue of a cyclic carboxylic acid anhydride having 4 to 10 carbon atoms, B represents $-R_4-$ or $-R_4NHCOOR_5OOCNHR_4-$, in which R_4 represents an alkylene group with 4 to 13 carbon atoms, cycloalkylene group or arylene group and R_5 represents an alkylene chain with 2 to 8 carbon atoms or an oxyalkylene chain with 2 to 4 carbon atoms, (b) 20 to 50% by weight of an organic high molecular weight polymer miscibile with said divinylurethane compound and having carboxyl groups on the side chains and an acid number of 30 or more and (c) 0.01 to 10% by weight of a light sensitizer capable of initiating the photopolymerization of an ethylenically unsaturated compound upon exposure to active radiation.

3,907,575
SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba; Haruo Takei; Akira Sato; Tadashi Ikeda, and Atsuo Iwamoto, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

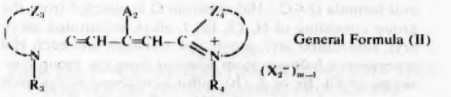
Filed Oct. 29, 1973, Ser. No. 410,572
Claims priority, application Japan, Oct. 27, 1972, 47-107783
Int. Cl.² G03C *1/14*
U.S. Cl. 96—124 **23 Claims**

1. In a silver halide photographic emulsion spectrally sensitized to have its maximum sensitivity in a wave length region of at least from 580 nm to 640 nm, the improvement which comprises said silver halide photographic emulsion containing a super sensitizing amount of a combination of at least one carbocyanine dye represented by the General Formula (I):



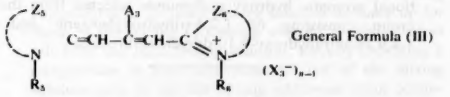
General Formula (I)

wherein Z_1 represents a group of atoms necessary for forming β-naphthoxazole ring or β-naphthoimidazole ring; Z_2 represents a group of atoms necessary for forming benzothiazole ring or a benzoselenazole ring; A_1 represents a hydrogen atom, an alkyl group or an aryl group; R_1 and R_2 each represents an aliphatic group with the proviso that at least one of R_1 or R_2 is a hydroxyalkyl group, a carboxyalkyl group or an alkyl group having a sulfo group; X_1^- represents an acid anion and l is 1 or 2, with the proviso that when l is 1 the dye forms an intramolecular salt; with at least one dye of the General Formula (II)



General Formula (II)

wherein Z_3 represents a group of atoms necessary for forming a benzothiazole ring, a β-naphthothiazole ring or a benzoselenazole ring; Z_4 represents a group of atoms necessary for forming a benzoxazole ring or a benzimidazole ring; A_2 represents a hydrogen atom, an alkyl group or an aryl group; R_3 and R_4 each represents an aliphatic group with the proviso that at least one of R_3 or R_4 is a hydroxyalkyl group, a carboxyalkyl group or an alkyl group having a sulfo- group; X_2^- is an acid anion; m is 1 or 2, but with the proviso that when m is 1, the dye forms an intramolecular salt; or of the General Formula (III)



General Formula (III)

wherein Z_5 and Z_6 each represents a group of atoms necessary for forming a benzothiazole ring, benzoselenazole ring, β-naphthothiazole ring or β-naphthoselenazole ring; A_3 represents a hydrogen atom, an alkyl group, or an aryl group; R_5 and R_6 each represents an aliphatic group with the proviso that at least one of R_5 or R_6 is a hydroxyalkyl group, a carboalkoxy group or an alkyl group having a sulfo group; X_3^- represents an acid anion group, n is 1 or 2, but with the proviso that when n is 1 the dye forms an intramolecular salt.

3,907,576
COMPOSITIONS CONTAINING WERNER COMPLEXES OF CHROMIUM AND FLUORINATED CARBOXYLIC ACIDS

Robert E. Dear, Mount Kisco, N.Y., and Jai Prakash Tandon, Cranston, R.I., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 22, 1972, Ser. No. 228,395
Int. Cl.² C09K *3/18*
U.S. Cl. 106—2 **5 Claims**

1. A water and oil-repellent composition containing a solvent and Werner type complexes prepared by reacting trivalent chromium with a mixture of

a. a fluorinated acid of the type R_fCOOH, and

b. a fluorinated acid of the type R_fCH_2COOH, wherein R_f is a perfluoroalkyl group of 3 to 18 carbon atoms and the mole ratio of chromium to acid types a and b is between 2:1 and 4:1, said composition containing from 10 to 99 parts by weight of R_fCOOH and correspondingly from 90 to 1 part by weight of R_fCH_2COOH.

3,907,577
MAKING SURFACE CRYSTALLIZED GLASS BODIES AND RESULTING PRODUCT

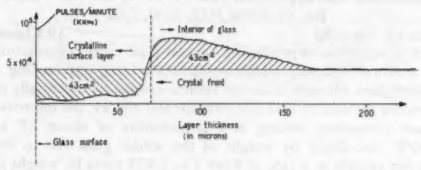
Dr. Werner Kiefer, Mainz-Mombach; Dr. Werner Sack, Mainz, and Dr. Dieter Krause, Mainz-Mombach, all of Germany, assignors to Jenaer Glaswerk Schott & Gen., Germany

Filed Dec. 21, 1973, Ser. No. 427,137

Claims priority, application Germany, Dec. 23, 1972, 2263234

Int. Cl.[2] C03C *3/22*

U.S. Cl. 106—39.7 **17 Claims**



17. A glass body having at least a partially crystalline surface layer of crystals selected from the group consisting of B-spodumene, h-quartz and mixtures thereof, said crystals having incorporated therewith a higher weight percentage of lithium and a lower percentage of other alkali metal oxide on a **100** weight percent total composition basis than was initially present in the glass comprising said body, at least a portion of such additional quantity of such lithium in said crystals having been obtained by internal lithium ion exchange of ions selected from the group consisting of sodium and potassium from interior portions of said glass body, said glass comprising initially on a 100 weight percent total composition basis:

from	[about]	52 to 70 %	by weight of	SiO_2
"	["]	10 to 25 %	"	Al_2O_3
"	["]	0 to 8 %	"	B_2O_3
"	["]	0 to 10 %	"	P_2O_5
"	["]	1 to 4 %	"	Li_2O
"	["]	0 to 8 %	"	Na_2O
"	["]	0 to 10 %	"	K_2O
"	["]	0 to 5 %	"	MgO
"	["]	0 to 7 %	"	ZnO
"	["]	0 to 10 %	"	CaO
"	["]	0 to 12 %	"	BaO
"	["]	0 to 1,2 %	"	TiO_2
"	["]	0 to 2,5 %	"	ZrO_2

wherein the weight ratio of Li_2O/Al_2O_3 is not greater than 0.3, the sum of the respective weight percentages of TiO_2 plus ZrO_2 is not above 2,5 weight%, and the sum of the respective weight percentages of Na_2O plus K_2O is in the range from 1 to 10 weight%.

3,907,578
COMPOSITIONS FOR INHIBITING THE CORROSION OF METALS

Claude-Jacques Scherrer, Le Havre; Jean-Louis Mauleon, Saint Addresse, and Jean-Daniel Gmerek, Bleriot Place, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France and Universal Oil Products Company, Des Plaines, Ill., part interest to each

Filed Apr. 20, 1973, Ser. No. 353,048

Claims priority, application France, Apr. 18, 1972, 72.13600

Int. Cl. C23f *15/00*

U.S. Cl. 106—14 **6 Claims**

1. A composition for inhibiting the corrosion of metals due to contact with water containing a chloride contaminant, said composition comprising a mixture of (a) a salt of a dicarboxylic acid containing from about 10 to about 50 carbon atoms and an aliphatic amine containing from about 10 to about 30 carbon atoms, said salt containing an acid to amine ratio of about 1:1 to about 3:1 equivalents of acid per equivalent of amine, and (b) a cyclic amine or a mixture of cyclic amines containing 10 or less carbon atoms.

3,907,579
MANUFACTURE OF POROUS CERAMIC MATERIALS

Frank Ernest George Ravault, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Dec. 29, 1972, Ser. No. 319,849

Claims priority, application United Kingdom, Jan. 14, 1972, 1930/72

Int. Cl.[2] C04B *35/00*

U.S. Cl. 106—41 **3 Claims**

1. In the method of making a permeable ceramic structure which comprises impregnating an organic foam with a slurry of a finely divided ceramic material, and drying and firing the so-impregnated foam, the improvement which comprises including at least 0.1% by weight of anti-foaming agent in the slurry.

3,907,580
NAIL VARNISHES

Goswin Clemens van Ham, Wiesbaden-Bierstadt, Germany, assignor to Margaret Astor AG, Mainz, Germany

Continuation-in-part of Ser. No. 305,850, Nov. 12, 1972, abandoned. This application Mar. 14, 1973, Ser. No. 341,040

Int. Cl. A61k *7/04;* **C08b** *21/12, 21/14*

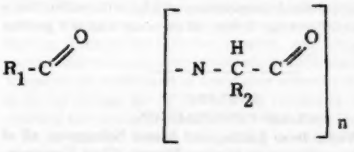
U.S. Cl. 106—158 **21 Claims**

1. In a liquid nitrocellulose nail varnish containing organic solvents selected from the group consisting of ethyl acetate, butyl acetate toluol and mixtures thereof for the varnish, the improvement which comprises at least one scleroprotein derivative insoluble in varnish organic solvents alone and soluble in aqueous or aqueous-alcoholic solutions and in said nitrocellulose varnish and selected from the group consisting of:

a. between about 0.05 to 6 percent of a collagen hydrolysate of animal origin with a pH in the range of about from 3 to 7.5;

b. between about 0.05 and 6 percent of an ester produced by alcoholic esterification of polypeptides which have a salt content of from 0 to about 3 percent and which are produced by acidic hydrolysis of scleroprotein, said esters having the general formula: $H_2N—CHR—CO\ (HN—CHR—CO)_n—NH—CHR—COOAlc$ wherein:
R is an amino acid side chain
n is an integer between 3 and 300
Alc is an aliphatic group having 1 to 8 carbon atoms;

c. between about 0.05 and 4 percent of a protein fatty acid condensate of a general formula



wherein:

R_1 is a saturated or unsaturated hydrocarbon having from 8 to 17 carbon atoms and from 17 to 37 hydrogen atoms

R_2 is an amino acid side chain

n is an integer between 3 and 300

A is hydrogen, alkali metal, amino, or monovalent or polyvalent cation; and

d. mixtures thereof, the scleroprotein derivative being dissolved in the nail varnish in the absence of water.

3,907,581

OPALESCENT TiO_2-CONTAINING COMPOSITIONS

Oswin Burr Willcox, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 237,547, March 23, 1972, abandoned. This application Dec. 5, 1972, Ser. No. 312,258

Int. Cl.[2] C08K *3/22*; C08L *1/18*, *25/06*, *77/00*

U.S. Cl. 106—193 J 5 Claims

1. A solid polymeric composition which is useful for fabricating decorative objects and forms having the apparance of pure, natural opal, said composition consisting of a substantially clear, colorless organic polymeric solid matrix free of light scattering material and 10^{-4} to 10 volume percent of titanium dioxide substantially homogeneously dispersed therein, and titanium dioxide consisting of particles being at least 70 percent by weight of the rutile crystal structure and having a mean equivalent volume diameter by number of between 0.05 and 0.10 micron and essentially free of particles having a dimension above 0.15 micron.

3,907,582

ASPHALT ROAD COMPOSITION AND PROCESS OF MAKING SAME

C. Edward Walter, 203 E. 39th St., Baltimore, Md. 21218

Continuation-in-part of Ser. No. 263,170, June 15, 1972, abandoned. This application Apr. 26, 1973, Ser. No. 354,917

Int. Cl.[2] C08K *3/00*; C08L *95/00*

U.S. Cl. 106—281 R 13 Claims

1. An asphaltic pavement course composition consisting essentially of from about 5 to about 95 percent by weight of said composition of substantially unfused and substantially unclinkered continuous feed municipal incinerator residue, said residue having at most 15 percent LOI, a maximum particle size of less than about 2 inches, and a ferrous content no more than 5 percent by weight, from 0 to 3¾ percent by weight of said composition of lime and 0–90 percent by weight of mineral aggregate having a maximum average diameter of 1½ inches, and from 5 to 11 percent by weight of asphalt, said asphalt based on the weight of the other components in said composition.

3,907,583

GRINDING RUBBER-REINFORCING CARBONACEOUS PIGMENT WITH SULFUR

Grant Crane, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 16, 1973, Ser. No. 389,104

Int. Cl.[2] C09C *1/44*

U.S. Cl. 106—307 2 Claims

1. The process of producing a reinforcing black from brittle carbonaceous material produced by the pyrolization of scrap rubber in the substantial absence of air, which process comprises grinding the carbonaceous material in a fluid-energy mill in an atmosphere of steam in the presence of 0.01 to 10 percent of sulfur based on the weight of the carbonaceous material, at an elevated temperature at which the sulfur has a vapor pressure of at least 1 mm. of mercury and not greater than 760 mm.

3,907,584

GLASS COMPOSITION

Masamichi Wada; Iwao Ishida, and Isamu Nakagawa, all of Otsu, Japan, assignors to Nippon Electric Glass Company, Limited, Japan

Filed Dec. 12, 1972, Ser. No. 314,420

Claims priority, application Japan, Dec. 20, 1971, 46-102574The portion of the term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

Int. Cl.[2] C03C *3/04*

U.S. Cl. 106—53 9 Claims

1. A glass composition consisting essentially of, by weight, 58–66% of SiO_2, 1–4% of Al_2O_3, 6–15% of K_2O, 2–8% of Na_2O, 0.5–4% of CaO, 10–18% of BaO, 0.1–4% of WO_3, 0.5–3% of PbO, 0.1–0.6% of CeO_2, up to 2% of MgO, up to 4.5% of SrO, and the sum of PbO, BaO, WO_3 and SrO being more than 15%.

3,907,585

METHOD OF PRODUCING A SEALING GLASS COMPOSITION WITH A UNIFORM VISCOSITY

Josef Francel, and James E. King, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 421,035, Dec. 3, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,207

Int. Cl. C03c *3/12*, *3/00*, *1/02*

U.S. Cl. 106—53 19 Claims

1. In a method of producing a solder glass paste composition of uniform viscosity which comprises adding and mixing a solder glass frit with a carrier vehicle consisting essentially of a binder for said frit and a solvent for said binder, the improvement comprising adding at a temperature of about 32° to 100°F. two-thirds by weight of the solder glass frit to the carrier vehicle at a rate of from 1 to 1.875 parts by weight of the solder glass frit per minute for each part by weight of the carrier vehicle while concurrently mixing the same at a mixing speed of 400 to 850 revolutions per minute to obtain a frit to vehicle weight ratio of from about 7.3:1 to about 8.7:1 and then adding the remaining one-third of the solder glass frit to the carrier vehicle at a rate of from 1 to 1.875 parts by weight of the solder glass frit per minute for each part by weight of the carrier vehicle while concurrently mixing the same at a mixing speed of 1,500 to 1,900 revolutions per minute.

3,907,586

GLASS ARTICLES HAVING A BROWN TO REDDISH-BROWN COLOR FROM BOROSILICATE GLASS OF A LOW THERMAL EXPANSION BY MEANS OF SILVER DIFFUSION DYE

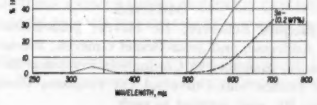
Werner Kiefer, Mainz, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed June 28, 1973, Ser. No. 374,629

Claims priority, application Germany, June 28, 1972, 2231563

Int. Cl.[2] C03C *3/04*

U.S. Cl. 106—54 12 Claims



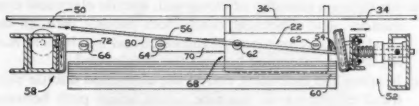
1. In a borosilicate glass having at least a portion thereof silver diffusion dyed to a brown to reddish brown color, having a thermal coefficient of expansion of less than 33.5×10^{-7} cm $\cdot$ $cm^{-1} \cdot °C^{-1}$ and being essentially free of arsenic oxide and antimony oxide, the improvement which comprises 0.005–0.5 wt. % tin uniformly dispersed therein by admixture to the melt phase of said glass, whereby a substantially deeper brown to reddish brown color is obtained, the depth of color being proportional to the amount of tin added.

3,907,587

METHOD AND APPARATUS FOR REMOVING BROKEN-FF CHIPS FROM A SHEET STACKING STATION

Dwight A. Bollinger, Hadley, and William P. Cathers, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 13, 1973, Ser. No. 424,586
Int. Cl.[2] B08B 5/00; B65G 57/00
U.S. Cl. 134—32 10 Claims



1. In a method of stacking a sheet on a receiving surface, the sheet having a leading edge and a trailing edge with break away protrusions at least at the leading edge, including the steps of moving the sheet along a trajectory path over the receiving surface; and engaging the leading edge of the sheet as it moves along the trajectory path to align the sheet on the receiving surface wherein the protrusions at the leading edge break away from the leading edge as chips when the leading edge is engaged and a number of the chips are projected over uppermost surface of the sheet, wherein the improvement comprises the step of:

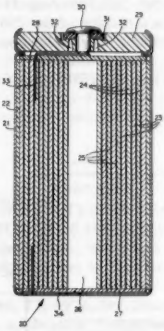
removing the chips projected over the uppermost surface of the sheet (1) while the chips are airborne and (2) in a direction away from the receiving surface and the trajectory path.

3,907,588

ELECTROCHEMICAL CELL AND SAFETY RESISTOR THEREFOR

Bernard C. Bergum, Monona, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Jan. 21, 1970, Ser. No. 4,560
Int. Cl.[2] H01M 35/00
U.S. Cl. 136—6 R 12 Claims



1. An electric cell having a pair of electrodes of opposite polarity, a separator between said electrodes, an electrolyte, and terminals for connecting said cell in a circuit, and a resistive element interposed in the current path connecting one of said electrodes with one of said terminals, said resistive element being made of a metallic material of high resistivity, said resistive element being internally connected between said electrode and said terminal, said resistive element being non-corrosive in said electrolyte and being capable of limiting the maximum discharge current of said cell to a safe level while not affecting the normal cell characteristics and providing sufficient resistance to reduce the flash amperage current of said cell to a safe level, said resistive element having a value as determined by the equation:

$$R_a = \frac{E}{I_p} - \frac{E}{I_i}$$

where R_a is the ohmic value of said resistive element, E is the open circuit voltage of said cell; I_i is the initial flash current of said cell in the absence of said resistive element in said current path; and I_p is the flash current of said cell with said resistive element in said current path, said resistive element being made of an alloy material comprising 84% Co, 12% Mn, and 4% Ni and having a resistance in the range of about 0.03 ohm to about 0.15 ohm.

2. An electrical cell having a pair of electrodes of opposite polarity, a separator between said electrodes, an electrolyte, and terminals for connecting said cell in a circuit, and a resistive element interposed in the current path connecting one of said electrodes with one of said terminals, said resistive element being made of a metallic material of high resistivity and providing sufficient resistance to reduce the flash amperage current of said cell to a safe level, said resistive element having a value as determined by the equation:

$$R_a = \frac{E}{I_p} - \frac{E}{I_i}$$

where R_a is the ohmic value of said resistive element; E is the open circuit voltage of said cell; I_i is the initial flash current of said cell in the absence of said resistive element in said current path, said resistive element being made of an alloy comprising 80% Ni and 20% Cr and having a resistance in the range of about 0.03 ohm to about 0.15 ohm, and I_p is the flash current of said cell with said resistive element in said current path and wherein a fully assembled sealed cell is housed within a battery container having two terminal contacts said resistive element connecting one cell electrode terminal with the corresponding terminal contact of said battery container, said resistive element providing sufficient additional resistance to the overall cell impedance to reduce the maximum discharge current to a safe level while having essentially no effect on the normal cell operating characteristics.

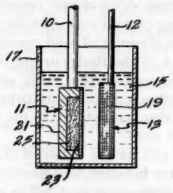
3. An electric cell having a container, a pair of electrodes of opposite polarity (positive and negative), a separator between said electrodes, an electrolyte, two terminals (positive and negative) for connecting said cell in a circuit, and a resistive element within the cell container interposed in the current path connecting at least one of said electrodes with one of said terminals, said resistive element being made of a metallic material of high resistivity and being in physical contact with said electrode to which it is connected whereby the electrode acts as a heat sink to dissipate heat generated by the current flowing through the resistive element, and said resistive element being non-corrosive in said electrolyte and having a high temperature coefficient of resistance whereby as the element heats up during use of the cell the resistance increases and restricts the maximum current flow to a safe level.

9. An electric battery comprising a battery container and having at least one fully assembled sealed cell within said battery container, said battery container having two terminal contacts for making electrical contact with the positive and negative cell terminals, a resistive element connecting at least one cell terminal with the corresponding terminal contact of said battery container, said resistive element being made of a metallic material having a high resistivity and a high temperature coefficient of resistance whereby as the element heats up during use of the battery the resistance increases and restricts the maximum current flow of the battery to a safe level.

3,907,589
CATHODE FOR A SECONDARY ELECTROCHEMICAL CELL

Eddie C. Gay, Park Forest, and Fredric J. Martino, Dolton, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 18, 1974, Ser. No. 434,459
Int. Cl. H01m *43/00*
U.S. Cl. 136—6 R **10 Claims**



1. In a secondary electrochemical cell including an alkali metal reactant in the anode, a cathode composition including a chalcogen reactant in the cathode and an electrolyte containing ions of said alkali metal, the improvement wherein said cathode composition comprises: at least one transition metal sulfide and a sulfide reaction product of said alkali metal and said transition metal sulfide, the total atomic concentration of sulfur combined with said transition metal and said alkali metal reactant within said cathode being in stoichiometric excess of the total atomic concentration of said transition metal.

6. A method of preparing a cathode for use in a secondary electrochemical cell wherein said cell includes a cathode structure with inner chamber, an anode with an alkali metal reactant, and an electrolyte including ions of said alkali metal in contact with both of said electrodes, the improvement comprising:

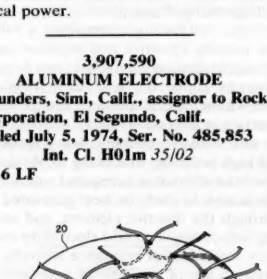
a. blending particulate transition metal sulfide, sulfide reaction product of said anode reactant and said transition metal sulfide, molten electrolyte and particles of electrically conductive material to form a cathode composition; and

b. assembling said cathode composition into said cathode structure of said electrochemical cell for use as a source of electrical power.

3,907,590
ALUMINUM ELECTRODE

Richard C. Saunders, Simi, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 5, 1974, Ser. No. 485,853
Int. Cl. H01m *35/02*
U.S. Cl. 136—6 LF **10 Claims**



1. In a rechargeable battery containing a molten salt electrolyte, an aluminum-alloy anode and a sulfur-containing cathode, the improvement comprising

an attachment means located in the battery to provide electrical communication to a terminal external to the battery and a plurality of elongated ductile electrical conductors extending through the anode, at least one of the conductors having an end portion extending beyond the anode and attached to said attachment means, said end portion describing a serpentine path intermediate the anode and said attachment means.

6. A method of structurally supporting and providing electrical contact throughout an aluminum alloy anode located in a rechargeable battery of the type which utilizes a molten salt electrolyte and a sulfur-containing cathode comprising

a. providing an attachment means in the battery, said attachment means providing a path of electrical communication to a terminal external to the battery;

b. providing a plurality of elongated, ductile electrical conductors, said electrical conductors passing through the anode, and at least one of the electrical conductors having an end extending beyond the anode; and

c. bending the extending end of the elongated ductile electrical conductor to describe a non-linear path between the anode and said attachment means, and attaching the extending end to said attachment means; whereby there is provided structural support for an electrical contact throughout the anode, and a movable electrical contact is provided between the anode and said attachment means.

3,907,591
POSITIVE SULPHUR ELECTRODE FOR GALVANIC CELLS AND METHOD OF PRODUCING THE SAME

Helmut Lauck, Schlossborn, Germany, assignor to Varta Aktiengesellschaft, Frankfurt am Main, Germany

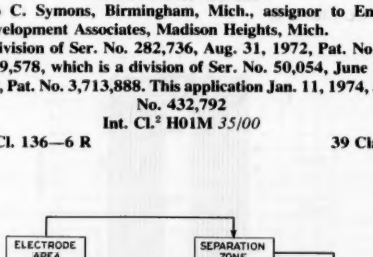
Division of Ser. No. 319,726, Dec. 29, 1972, abandoned. This application Oct. 22, 1974, Ser. No. 516,902
Claims priority, application Germany, Dec. 30, 1971, 2165634
Int. Cl.² H01M *35/00*
U.S. Cl. 136—6 LN **4 Claims**

1. A galvanic cell having a negative electrode formed of light metal and an electrolyte containing a conductive salt in an organic solvent, a positive sulphur electrode formed of amorphous, insoluble sulphur having an additive of conductive material.

3,907,592
HALOGEN HYDRATES

Philip C. Symons, Birmingham, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Division of Ser. No. 282,736, Aug. 31, 1972, Pat. No. 3,809,578, which is a division of Ser. No. 50,054, June 26, 1970, Pat. No. 3,713,888. This application Jan. 11, 1974, Ser. No. 432,792
Int. Cl.² H01M *35/00*
U.S. Cl. 136—6 R **39 Claims**



1. A process for producing halogen hydrate in a housing containing an electrode area with at least one positive and one negative electrode therein, comprising:

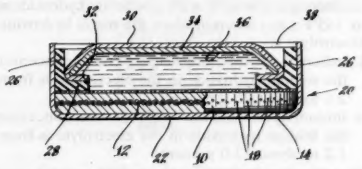
1. passing a current through an aqueous metal halide electrolyte solution thereby generating halogen at the positive electrode;

2. forming a halogen hydrate from the halogen generated during step (1); and
3. separating a halogen hydrate from the solution.

3,907,593
ELECTROCHEMICAL CELLS

Nikola Marincic, Winchester, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 17, 1974, Ser. No. 470,890
Int. Cl.[2] H01M *35/00*
U.S. Cl. 136—7 **19 Claims**



1. An electrochemical cell comprising a housing; a solid oxidizable active anode material within said housing but not in electrical contact therewith; a composite cathode structure within said housing comprising a foraminous metallic screen coated with a solid, porous cathode material said screen having sharp spikes at the ends at the perimeter thereof which cut into the walls of said housing thereby making firm mechanical and electrical contact therewith whereby said housing can be used as the external cathode contact of said cell; and an electrolyte between and in contact with said anode material and said composite cathode structure; said cathode material being sufficiently porous to permit electrolyte transfer therethrough.

4. An electrochemical cell comprising a housing; a solid oxidizable active anode material within said housing but not in electrical contact therewith; a composite cathode structure within said housing comprising a foraminous metallic screen coated on the top and bottom surfaces thereof with a solid, porous cathode material, said screen having sharp spikes at the ends at the perimeter thereof which cut into the walls of said housing thereby making firm mechanical and electrical contact therewith, whereby said housing can be used as the external cathode contact of said cell; and an electrolyte between and in contact with said anode material and said composite cathode structure, said electrolyte comprising an inorganic, electrochemically reducible oxyhalide or thiohalide solvent and a solute dissolved therein, said solvent being electrochemically reduced upon the surface of said cathode material during operation of said cell, whereby said solvent material in conjunction with said oxidizable anode material is utilized as a source of electrical energy; said cathode material being sufficiently porous to permit electrolyte transfer therethrough.

3,907,594
METHOD OF MANUFACTURING LEAD ELECTRODES FOR STORAGE CELLS

Pierre Jonville; Helmut Stöhr, and Klaus D. Beccu, all of Geneva, Switzerland, assignors to Battelle Memorial Institute, Switzerland

Filed Feb. 12, 1974, Ser. No. 441,813
Claims priority, application Switzerland, Feb. 12, 1973, 1959/73
Int. Cl. H01m *35/00*
U.S. Cl. 136—27 **11 Claims**

1. Process of manufacturing electrodes for lead storage batteries, comprising the steps of:
a. providing a felt of glass fibers in the form of a strip or sheet;
b. preparing an electrode support structure from said felt of glass fibers in the form of a strip or sheet by depositing thereon lead or a lead alloy so as to at least partially cover the fibers of the felt and thereby provide conductive zones on said support;
c. introducing into the felt support by filtration a mass of powdered lead-based material capable of subsequently producing an active electrode mass by at least one electrochemical transformation thereof; and
d. cutting the felt into individual electrode bodies of desired shape and size.

3,907,595
SOLAR CELLS WITH INCORPORATE METAL LEYER

Joseph Lindmayer, Bethesda, Md., assignor to Communications Satellite Corporation (COMSAT), Washington, D.C.

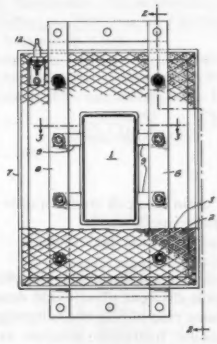
Filed Dec. 3, 1971, Ser. No. 204,467
Int. Cl. H01l *15/02*
U.S. Cl. 136—89 **21 Claims**

1. An improved solar cell comprising
a. a first epitaxial layer of highly ordered semiconductor material having an N-type region and a P-type region with the interface between the two regions forming a P-N junction, one of said regions extending to a top surface of said layer and the other said region extending to a bottom surface of said layer, said semiconductor material having an energy band gap in the range 1–2 eV:
b. a highly ordered epitaxial layer of material exhibiting metallic properties of light reflection and electric conductivity in contact with and forming a barrier interface with said semiconductor layer at said bottom surface thereof.

3,907,596
SEA WATER BATTERY

Albert E. Ketler, Jr., Blairsville, Pa., assignor to Ocean Energy, Inc., Blairsville, Pa.

Continuation of Ser. No. 248,772, April 28, 1972, abandoned, which is a continuation of Ser. No. 60,428, Aug. 3, 1970, abandoned. This application July 1, 1974, Ser. No. 484,805
Int. Cl. H01m *17/02*
U.S. Cl. 136—100 R **7 Claims**



1. A galvanic battery for immersion usage in a saline water solution which comprises, metal anode means, at least a pair of cathodes of a different metal than said anode means, each of said cathodes having a pair of opposed inner and outer vertically elongated substantially planar wide face grid-like metal portions in high pressure contact with metal wool securely interposed therebetween, said anode means having at least a pair of vertically elongated substantially planar opposed wide face portions, said cathodes having their inner wide face portions in a spaced-apart and opposed relation with respect to each other on opposite sides of and in a substantially uniform spaced-apart relation with the pair of wide face

portions of said anode means, means extending across between said pair of cathodes for securing said anode means in the above defined positioning and in an electrically insulated relationship with respect to said cathodes, and said anode means and said cathodes defining in their mounted relationship with respect to each other upper and lower vertical end portions that are substantially fully open to the spacing between the planar face portions of said anode means and said cathodes for circulation of the saline solution therethrough.

3,907,597
NONAQUEOUS CELL HAVING AN ELECTROLYTE CONTAINING SULFOLANE OR AN ALKYL-SUBSTITUTED DERIVATIVE THEREOF

Geoffrey W. Mellors, Strongsville, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

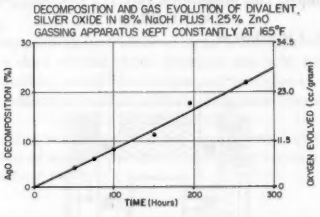
Filed Sept. 27, 1974, Ser. No. 509,820
Int. Cl.² H01M *17/00*
U.S. Cl. 136—100 R **11 Claims**

1. A nonaqueous cell comprising a highly active metal anode selected from the group consisting of lithium, potassium, calcium, magnesium, and their alloys, a solid cathode, and a nonaqueous electrolyte consisting essentially of at least one solvent selected from the group consisting of sulfolane and its liquid alkyl-substituted derivatives thereof essentially free of water, at least one low viscosity organic cosolvent and an ionizable solute.

3,907,598
SEALED LOW DRAIN RATE DRY CELL HAVING IN SITU STABLE DIVALENT SILVER OXIDE DEPOLARIZER

El Sayed Megahed, Madison, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Apr. 26, 1973, Ser. No. 354,782
Int. Cl. H01m *21/00*
U.S. Cl. 136—107 **16 Claims**



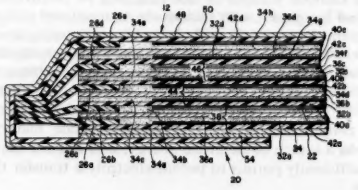
1. A sealed low drain rate cell comprising in combination
a. an electronegative metal anode;
b. an alkali metal hydroxide electrolyte;
c. a cell barrier; and
d. an in situ stable divalent silver oxide depolarizer, wherein the in situ stable divalent silver oxide depolarizer has a maximum gassing rate of 500 microliters/gram/hr. in a 2 percent potassium hydroxide solution at 165°F., and wherein when the metal hydroxide in the electrolyte is:
i. sodium hydroxide, the weight percent concentration of the sodium hydroxide in the electrolyte is from about 2.0 percent to about 20.0 percent;
ii. lithium hydroxide, the weight percent concentration of the lithium hydroxide in the electrolyte is from about 1.2 percent to about 13.0 percent;
iii. potassium hydroxide, the weight percent concentration of the potassium hydroxide in the electrolyte is from about 3.0 percent to about 25.0 percent;
iv. rubidium hydroxide, the weight percent concentration of the rubidium hydroxide in the electrolyte is from about 5.0 percent to about 40.0 percent;
v. cesium hydroxide, the weight percent concentration of the cesium hydroxide in the electrolyte is from about 7.5 percent to about 50.0 percent.

12. A low drain rate power system comprising in combination:
a. a power consuming device; and
b. a sealed low drain rate cell in electrical contact therewith, said low drain rate cell comprising;
i. an electronegative metal anode;
ii. an alkali metal hydroxide electrolyte;
iii. a cell barrier; and
iv. an in situ stable divalent silver oxide depolarizer,
wherein the in situ stable divalent silver oxide depolarizer of the sealed cell has a maximum gassing rate of 500 microliters/gram/hour in a 2% potassium hydroxide solution at 165°F., and wherein when the metal hydroxide in the electrolyte is:
i. sodium hydroxide, the weight percent concentration of the sodium hydroxide in the electrolyte is from about 2.0 to about 20.0 percent;
ii. lithium hydroxide, the weight percent concentration of the lithium hydroxide in the electrolyte is from about 1.2 to about 13.0 percent;
iii. potassium hydroxide, the weight percent concentration of the potassium hydroxide in the electrolyte is from about 3.0 to about 25.0 percent;
iv. rubidium hydroxide, the weight percent concentration of the rubidium hydroxide in the electrolyte is from about 5.0 to about 40.0 percent;
v. cesium hydroxide, the weight percent concentration of the cesium hydroxide in the electrolyte is from about 7.5 to about 50.0 percent.

3,907,599
FLAT BATTERY

Ralph D. Fanciullo, Waltham, and Ludwig G. Fasolino, Wellesley, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 10, 1974, Ser. No. 478,061
Int. Cl. H01m *21/00*
U.S. Cl. 136—111 **16 Claims**



1. In a planar battery having a multiplicity of discrete electrically conductive layers arranged in cooperative electical association with one another to form a multicell battery, the improvement comprising:
continuous frame-type electrically insulative sheet sealing means having a first surface adjacent an inner opening therein thermally bonded to one peripherally disposed surface of each said discrete electrically conductive layer and extending outwardly from the periphery of said electrically conductive layer to define a continuous border sealing portion; and
discrete, sheet-type separator means positioned intermediate superposed ones of said electrically conductive layers and shaped having a periphery extending beyond said sealing means inner opening, said periphery remaining within said border sealing portion.

3,907,600

ELECTRODE OF SELENIDES OR TELLURIDES

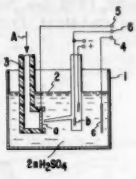
Franz Arthur Pohl, Gotzenhain, and Harald Böhm, Oberursel, both of Germany, assignors to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Germany

Filed June 9, 1970, Ser. No. 44,797

Claims priority, application Germany, June 9, 1967, 19291161

Int. Cl. H01m *13/02*

U.S. Cl. 136—121 3 Claims



1. An electrode consisting essentially of at least one compound selected from the group consisting of the tellurides and selenides of the elements molybdenum, tungsten and chromium, and further containing at least one compound selected from the group consisting of molybdenum sulfide and tungsten sulfide.

3,907,601

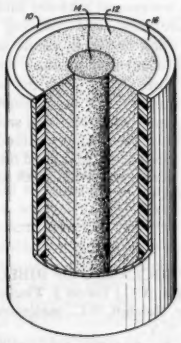
VINYL BATTERY SEPARATORS

Hugh Ferdinand Schaefer, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 12,034, Feb. 17, 1970, abandoned. This application Feb. 14, 1972, Ser. No. 226,036

Int. Cl. H01m *9/04*

U.S. Cl. 136—131 13 Claims



1. An improvement in the method for making an electrolyte immobilizing separator for a Leclanche cell of the type employing a comparatively dry pressure-molded bobbin of depolarizer mix, and a zinc anode which also serves as a cell container, the improvement comprising introducing into said cell container a separator forming material comprising a solution of vinyl material and electrolyte under predetermined and controlled viscosity levels, introducing said bobbin into said cell container in a manner such as to form a layer of separator material between said cell container and said bobbin while simultaneously gelling said solution by polymerization and cross-linking thereof in situ, and controlling the viscosity of said solution during said gellation, said separator forming material being prepared by forming an initial solution of polyacrylamide and electrolyte, and combining said initial solution with vinyl monomer and appropriate gelling agents.

3,907,602

SELF-TIGHTENING SEALING ARRANGEMENT FOR AN ENCLOSURE SUCH AS A CASING FOR AN ELECTROCHEMICAL CELL

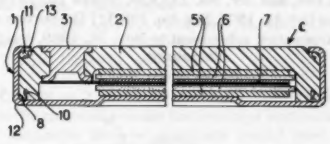
Francis Sperandio, Le Bouscat, and Michel Guglieri, Bassens, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Sept. 5, 1974, Ser. No. 503,260

Claims priority, application France, July 12, 1974, 74.24354

Int. Cl. H01m *1/02*

U.S. Cl. 136—133 6 Claims



1. Self-tightening sealing arrangement for a container constituted by two parts in the shape of cups respectively forming a bottom and a lid with the rim of the first part being turned down onto the second part, said turning down pressing rim portions of that second part against a portion of the first part, said first part being metallic, characterized in that said second part is of a plastic material and comprises on its whole periphery a lip providing, in the vicinity of its rim portion a space inside the container, said lip being in contact with a folded portion of the metal part and co-operating therewith to form a self-tightening seal when internal pressure rises within said container.

3,907,603

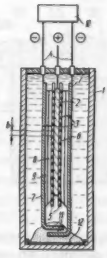
STORAGE CELL WITH DISSOLUBLE NEGATIVE LINE ELECTRODES

Meer Danilovich Kocherginsky, ul. Komarova 6, kv. 23; Sergei Leonidovich Kalachev, ul. Chasovaya, 26, kv. 106; Victor Arsenievich Naumenko, Novoslobodskaya ul., 62, kv. 64, and Lidia Fedorovna Penkova, ul. 3 Mytischinskaya 14a, kv. 124, all of Moscow, U.S.S.R.

Continuation-in-part of Ser. No. 327,848, Jan. 29, 1973, abandoned, which is a continuation of Ser. No. 98,762, Dec. 16, 1970, abandoned. This application Aug. 15, 1973, Ser. No. 388,641

Int. Cl.[2] H01M *6/00*

U.S. Cl. 136—140 14 Claims



1. A storage cell comprising: an electrolyte-filled jar; dissoluble zinc electrodes movably supported within said jar for undergoing movement in the course of charging; positive electrodes fabricated from oxides of nickel or silver or air-depolarized electrodes, disposed in said jar in spaced juxtaposition with said zinc electrodes; current-collectors for said zinc and positive electrodes; plastic separators with holes, disposed between said zinc and said positive electrodes in facing rela-

tion therewith; means for imparting vibration to said current-collectors of said dissoluble zinc electrodes in a manner ensuring mechanical interaction between the entire surface of said zinc electrodes and said plastic separators and compaction of a sponge-zinc deposit forming on said zinc electrode in the process of charging.

3,907,604

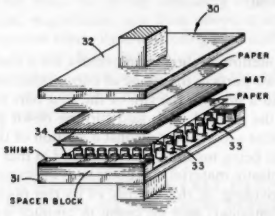
NONWOVEN MAT BATTERY SEPARATORS

James S. Prentice, Joliet, Ill., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. Nos. 865,089, Oct. 9, 1969, Pat. No. 3,704,198, and Ser. No. 233,826, March 10, 1972. This application Oct. 17, 1972, Ser. No. 298,317The portion of the term of this patent subsequent to Nov. 28, 1989, has been disclaimed.

Int. Cl. H01m *3/02*

U.S. Cl. 136—146 **4 Claims**



1. In a battery, a positive plate, a negative plate and a nonwoven mat of polypropylene fibers, said nonwoven mat positioned between and separating said positive and said negative plates and said nonwoven mat having polypropylene fibers having diameters from about 1 to about 10 microns, said mat having fusion-bonds throughout its thickness, the strip tensile strength of the mat being greater than about 4,000 m and the tear resistance of the mat being no greater than about 3,000dm².

3,907,605

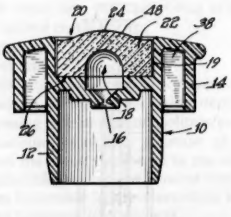
BATTERY CAP WITH FLAME BARRIER VENT FILTER

Robert Richard Melone, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 18, 1974, Ser. No. 452,172

Int. Cl.² H01M *2/12*

U.S. Cl. 136—177 **5 Claims**



1. A battery cap comprising a skirt portion and a transverse partition wall thereacross defining an outwardly open cavity and an interior portion of the cap, said partition wall having a substantially centrally located aperture therethrough providing communication between the cavity and the interior of the cap, and a filter secured in said cavity and having an outer surface exposed to the surrounding atmosphere and an inner surface provided with a centrally located inwardly concave dome-shaped recess in communication with the interior of the cap through said aperture, the interior concave upper surface portion of said recess and the adjacent outer surface of the filter defining therebetween a reduced thickness wall portion in the central area of the filter of a substantially smaller thickness than in the surrounding area of the filter which is in contact with said cap.

3,907,606

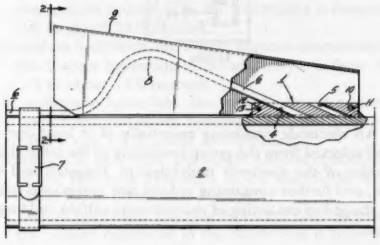
HEAT SHIELD FOR TEMPERATURE SENSORS

Robert C. C. Chang, Sao Paulo, Brazil, assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jan. 25, 1974, Ser. No. 436,403

Int. Cl.² H01L *35/00*

U.S. Cl. 136—233 **6 Claims**



1. A system for allowing a temperature sensor to sense the temperature of a heated body which the sensor is in thermal contact with while protecting the sensor from being irradiated by a heat source in the system and comprising:

a. a body, the temperature of which is to be measured;

b. a source of heat;

c. a temperature sensor in thermal contact with said body for measuring the temperature of said body; and

d. a hood means interposed between said heat source and said temperature sensor for reducing the radiation directly incident upon said temperature sensor to allow the sensor to more accurately measure the temperature of said body and also for allowing the service life of the sensor to be extended, said hood means including a top surface directly interposed between said heat source and said sensor and two side surfaces extending from said top surface down to said body, said hood means further defining an opening across its bottom with said opening fitting against said object.

3,907,607

CONTINUOUS PROCESSING OF RIBBON MATERIAL

Bing C. Chu, Raleigh, N.C.; David J. Fischer, Corning, N.Y., and Hans J. Kunz, Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 841,409, July 14, 1969, Pat. No. 3,711,073. This application May 18, 1972, Ser. No. 254,610

Int. Cl. H01l *7/44*

U.S. Cl. 148—1.5 **2 Claims**

1. The method of continuously processing ribbon-like material, comprising the steps of:

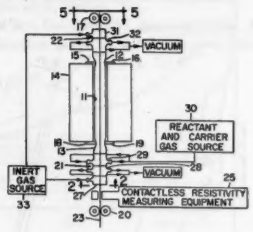
passing said material through a first region containing an inert gas,

passing said material through a first evacuation chamber,

passing said material through a region containing hot inert gas at an elevated temperature, the transfer of heat from said hot inert gas to said material preheating said material,

passing said material through a reaction chamber containing a reactant gas wherein said material is heated to a temperature sufficient to cause said reactant gas to react at the surface of said material,

passing said material through a second evacuation chamber, and



passing said material through a second region containing inert gas.

3,907,608

COATED METAL AND METHOD

Leo Donald Barrett, Cleveland Heights, and Irving Malkin, University Heights, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 173,243, Aug. 19, 1971, abandoned. This application June 15, 1973, Ser. No. 370,437

Int. Cl.² C23F *7/26*

U.S. Cl. 148—6.2 **21 Claims**

1. An aqueous coating composition for application to, and curing on, a metal substrate, thereby preparing an adherent water insoluble, alkali and corrosion resistant as well as substantially resinfree coating on said substrate, which composition before curing comprises an intimate mixture in aqueous liquid medium of:

A. a hexavalent-chromium-providing substance, supplied by about 80 to 100 weight percent chromic acid and providing above 5 but below about 100 grams per liter of chromium, expressed as CrO_3;

B. above 50 but below about 500 grams per liter of liquid medium of pulverulent metal selected from the group consisting of zinc, aluminum, mixtures thereof and alloys of same, said composition having a weight ratio of chromium, expressed as CrO_3, to pulverulent metal of between about 1:1 and 1:15;

C. below about 50 volume percent but substantially above 15 volume percent, based on the volume of the total liquid of the aqueous liquid medium, of water soluble organic liquid substance that maintains liquidity above 100°C. and is selected from the group consisting of tri-, and tetraethylene glycol, di-, and tripropylene glycol, and the water soluble low molecular weight ethers of all such foregoing glycols, diacetone alcohol, the water soluble low molecular weight ethers of diethylene glycol, and mixtures of the foregoing; and

D. above about 0.0005 volume percent, basis total volume of said coating composition, of dispersing agent.

20. The method of claim **19** wherein said coating is deposited on the substrate of a weldable metal stud and thereafter said stud is electrically resistance welded to another article of metal.

3,907,609

CONVERSION COATING FOR TITANIUM AND TITANIUM BASE ALLOYS

Dolphus Larry Coggins, Berkeley, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 14, 1974, Ser. No. 442,478

Int. Cl.² C23C *1/10;* **C23F** *7/24*

U.S. Cl. 148—6.2 **10 Claims**

4. A method of treating the surfaces of articles of titanium and titanium base alloys so that coatings will effectively bond to the surfaces thereof, which comprises contacting said articles with a solution consisting essentially of:

A. about 9 to about 36 percent by weight of an alkali metal hydroxide; and

B. about 0.08 to about 6 percent by weight of a hexavalent chromium compound.

3,907,610

PROCESS OF FORMING COLORLESS CHROMATE FILM ON AL, AL-ALLOY OR AL-COATED STEEL

Hidehisa Yamagishi, Yokohama; Hirokuni Mizuno, Tokyo; Yoshitaka Kashiyama, Kawasaki, and Yasuhiro Toyoda, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1974, Ser. No. 460,302

Claims priority, application Japan, Apr. 18, 1973, 48-43217; Apr. 18, 1973, 48-43809

Int. Cl.² C23F *7/26*

U.S. Cl. 148—6.2 **3 Claims**

1. In the chemical process for treating a workpiece of aluminum, aluminum alloy or aluminum coated steel to form a colorless chromate film thereon, the improvement therein wherein the workpiece is subjected to a pre-treatment comprising deoiling, rinsing with hot water, drying with hot air and, then wiping the water film still lying on the surface using drawing rolls and drying to obtain a uniform water thickness on the workpiece, the treating solution consisting of the following composition:

CrO_3 : 2 to 10g/l

Trivalent chromium: 0.05 to 1.00 g/l

Fluorine ion : 0.2 to 5g/l

Aluminum ion : 0.01 to 1.00g/l

Ferricyanide and/or ferrocyanide : 0.01 to 5.00g/l.

3,907,611

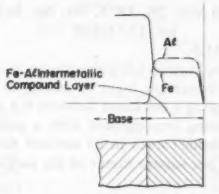
METHOD FOR MAKING FERROUS METAL HAVING HIGHLY IMPROVED RESISTANCES TO CORROSION AT ELEVATED TEMPERATURES AND TO OXIDIZATION

Takao Sasame, and Toshio Yagi, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Nov. 10, 1972, Ser. No. 305,558

Int. Cl.² C23C *11/00;* **B23P** *3/00*

U.S. Cl. 148—6.3 **6 Claims**



1. A method for making ferrous metal having highly improved resistance to corrosion and oxidization, which comprises dipping a ferrous workpiece in a molten metal bath containing an aluminum alloy containing chromium in an amount within the range of 1 to 10 percent by weight based on the total weight of said aluminum alloy, and having a temperature of from 750° to 930°C for from 30 to 300 seconds, heating the resultant ferrous workpiece for at least 30 minutes at an elevated temperature of from 700° to 930°C, and heating the thus treated ferrous workpiece at a predetermined termperature within the range of 950° to 1,350°C which is lower than the melting point of said ferrous workpiece, under an oxidizing atmosphere for not more than 10 hours, thereby forming an alloy layer uniformly over the surface of said ferrous workpiece, said alloy later containing iron and aluminum as its principle components and including a substantial layer of a α-Al_2O_3 secured therein by the binding action of said

iron, at the surface portion of said alloy layer, said surface portion containing chromium which acts as a binder for securing said substantial layer of α-Al_2O_3 in cooperation with said iron.

3,907,612

PREANNEAL RINSE PROCESS FOR INHIBITING PIN POINT RUST

Thomas Clifford Atkiss, Pottstown, and William August Kirn, Abington, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 15, 1974, Ser. No. 442,708
Int. Cl.[2] C21D *1/48;* B23K *35/34*
U.S. Cl. 148—18 **3 Claims**

1. The process for inhibiting pin point rusting of cold rolled annealed steel comprising contacting the steel prior to annealing with an aqueous rinse solution consisting essentially of one or more rust inhibiting compounds at a concentration ranging from about 5 grams/liter to saturated solution and selected from the group consisting of:

sodium tetraborate, ammonium fluosilicate, ammonium fluotitanate, chromic acetate, ammonium fluoborate, ammonium silico tungstate, potassium acid pyro antimonate, ammonium molybdate, monobasic aluminum formate, antimony trifluoride, ammonium metatungstate, antimony oxalate, ammonium titanium fluoride, silicon metatungstate, zinc fluoborate, tin fluoborate, and triphenyl antimony

to wet the steel with rinse solution, drying the wetted steel to leave a residue of rust inhibiting compound on the steel, and finally annealing the steel in a protective gas atmosphere at a temperature of about 1100° to about 1300°F.

3,907,613

PROTECTIVE COATINGS ON METALS AND ON THEIR ALLOYS

Jiri Bures, and Vojtech Fic, both of Brno, Czechoslovakia, assignors to Zbrojovka Brno, narodni podnik, Brno, Czechoslovakia

Filed Mar. 20, 1973, Ser. No. 342,975
Int. Cl.[2] C23F *7/02*
U.S. Cl. 148—31.5 **5 Claims**

1. A protective coating lying directly upon a metal, comprising a surface conversion layer of oxides of the metal, said surface layer having a thickness between 0.5 and 100 um, said surface layer being impregnated with a poly (2,6-dimethyl-1,4-phenylene oxide) resin in an amount varying between 1 and 250 grams per square meter of the surface to be coated.

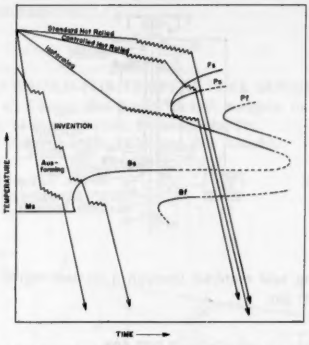
3,907,614

BAINITIC FERROUS ALLOY AND METHOD

Bruce L. Bramfitt, and Arnold R. Marder, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 316,962, Dec. 20, 1972. This application Feb. 27, 1974, Ser. No. 446,550
Int. Cl.[2] C22C *38/12*
U.S. Cl. 148—36 **4 Claims**

1. An as-worked bainitic ferrous alloy consisting essentially, by weight, of about 0.03 to 0.65 percent carbon, a minimum of about 0.25 percent molybdenum, an addition of at least one element selected from the group consisting of boron, manganese, nickel, and chromium, with the balance essentially iron, characterized by a crystallographic texture dominated by a (111) grain orientation and a microstructure of fine, elongated grains, with a lath-like substructure, where said lath-like



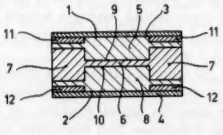
substructure is characterized by the presence of fine carbides at the lath boundaries and dispersed within the laths.

3,907,615

PRODUCTION OF A THREE-LAYER DIAC WITH FIVE-AYER EDGE REGIONS HAVING MIDDLE REGION THINNER AT CENTER THAN EDGE

Bernard H. Weijland, Beaverton, Oreg., assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 284,720, Aug. 20, 1972, abandoned, which is a continuation of Ser. No. 151,940, June 10, 1971, abandoned, and a continuation of Ser. No. 837,137, June 27, 1969, abandoned. This application Oct. 1, 1973, Ser. No. 402,161
Int. Cl. H01I *7/34*
U.S. Cl. 148—188 **5 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

a. providing a semiconductor body having a first conductivity type, said body having first and second major surfaces;

b. providing at said major surfaces respective first and second regions of a second opposite conductivity type, each of said first and second regions comprising first and second portions, said step of providing said regions being executed such that said first portions exceed said second portions in thickness and include therebetween first conductivity type first parts of said semiconductor body and further such that said second portions include therebetween first conductivity type second parts of said semiconductor body individually having a thickness exceeding those of said first parts;

c. providing at respective surface regions of only said second portions third semiconductor regions having said first conductivity type, said third regions defining respective third and fourth surfaces together with said first and second regions respectively; and

d. providing electrical connection means at said third and fourth surfaces.

3,907,616

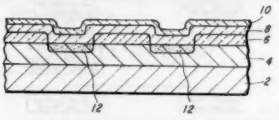
METHOD OF FORMING DOPED DIELECTRIC LAYERS UTILIZING REACTIVE PLASMA DEPOSITION

Klaus C. Wiemer, Richardson, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Continuation of Ser. No. 306,755, Nov. 15, 1972, abandoned. This application Aug. 16, 1974, Ser. No. 498,008

Int. Cl.[2] H01L 7/36

U.S. Cl. 148—188 13 Claims



1. A method of forming an impurity-doped dielectric layer on a substrate comprising the steps:

a. positioning the substrate in a reaction zone, said substrate having a masking layer with apertures therein on a surface of said substrate;

b. passing a gaseous silicon containing compound and a gaseous oxygen containing compound into contact with said substrate, and generating an RF discharge within said zone adjacent said substrate of sufficient energy to cause a reaction of said gases and the consequent reactive plasma deposition of a relatively thin, undoped silicon oxide layer on said masking layer, covering said substrate surface within the apertures in said masking layer;

c. without removing the substrate from said reaction zone, passing an inert gaseous carrier through a reservoir of dopant compound to provide a controlled amount of dopant vapor in said gaseous carrier;

d. passing a selected mixture of source gases adjacent to said substrate, said mixture comprising a flow of said carrier containing said dopant vapor, a controlled flow of a gaseous silicon providing compound, and a controlled flow of a gas which provides a source of oxygen; and

e. generating a low temperature RF discharge within said zone adjacent said substrate of sufficient energy to cause a reaction of said gases and the consequent reactive plasma deposition of a relatively thick dielectric layer on said relatively thin silicon oxide layer.

3,907,617

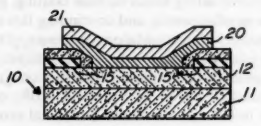
MANUFACTURE OF A HIGH VOLTAGE SCHOTTKY BARRIER DEVICE

Ross Zwernemann, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 191,672, Oct. 22, 1971, Pat. No. 3,821,772. This application Dec. 7, 1973, Ser. No. 422,942

Int. Cl.[2] H01L 7/34

U.S. Cl. 148—188 3 Claims



1. An improved method of forming a Schottky barrier device and guardring comprising the steps of:

a. forming on a surface of a semiconductor substrate of a first conductivity type a first layer of insulating material and forming an aperture through said first layer to expose the surface of said substrate;

b. forming a second layer of silicon dioxide doped with an impurity for providing conductivity of a type opposite said first conductivity type over said first layer and the exposed surface of said substrate in the aperture through said first layer;

c. forming an aperture through said second layer within said aperture through said first layer to expose the surface of said substrate so that a portion of said second layer remains in contact with said substrate along the entire edge of the aperture;

d. diffusing the impurity of said second layer into the substrate beneath the portion of said second layer in contact with said substrate to form a guardring; and

e. applying barrier and contact metals to the exposed surface of the substrate in the aperture and a portion of the surface of said second layer surrounding the aperture.

3,907,618

PROCESS FOR DOPING SEMICONDUCTOR EMPLOYING GLASS-CERAMIC DOPANT

James E. Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 7, 1974, Ser. No. 431,212

Int. Cl. H01i 7/36

U.S. Cl. 148—189 7 Claims

1. In the process for doping a semiconductor wherein a semiconductor and a glass-ceramic dopant host for vapor phase transport of B_2O_3 are maintained in vapor phase communication at a temperature and for a time sufficient to form a zone of P type conductivity in said semiconductor the improvement comprising a glass-ceramic host which has been formed by the in-situ thermal crystallization of a parent glass composition containing less than about 0.5 mole % of alkali metal oxide and consisting essentially of:

Component	Mole %
SiO_2	15–40
Al_2O_3	15–30
B_2O_3	20–60
RO	5–25

wherein

$$4 \quad \frac{Al_2O_3}{RO} \quad 1.5$$

Wherein RO is:

MgO	0–15
CaO	0–10
SrO	0–10
BaO	0–10
La_2O_3	0–5
Nb_2O_5	0–5
Ta_2O_5	0–5

said glass-ceramic host being rigid and dimensionally stable during the doping period at temperatures in excess of about 1,050°C.

3,907,619

SOLUTION CAST DOUBLE BASE PROPELLANTS AND METHOD

Donald E. Elrick, Rawlings, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1964, Ser. No. 341,459

Int. Cl.[2] C06B 45/00

U.S. Cl. 149—2 9 Claims

1. A method for the preparation of a double base propellant grain which comprises the steps of

1. pretreating nitrocellulose by
   a. stirring 100 grams of dry nitrocellulose into a solution of 2 grams of phenyl isocyanate in 500 grams of carbon tetrachloride,
   b. filtering the resulting mixture and
   c. drying the residue;
2. rotationally stirring 15 parts by weight of the pretreated nitrocellulose with 3 parts red lead, 1 part nitrodiphenylamine, 57.1 parts by weight nitroglycerin and 23.6 parts by weight triacetin until a viscous mixture results,
3. adding to this mixture tolylene diisocyanate,
4. transferring the resulting mixture under reduced pressure to a container and,
5. curing for 5 days at 50°C.

3,907,620

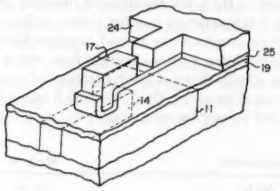
A PROCESS OF FORMING METALLIZATION STRUCTURES ON SEMICONDUCTOR DEVICES

Howard E. Abraham, Loveland, Colo.; George E. Bodway, San Jose, and Weldon H. Jackson, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 374,230, June 27, 1973, Pat. No. 3,877,063. This application Apr. 18, 1974, Ser. No. 461,812

Int. Cl.[2] H01L *21/312, 21/318*

U.S. Cl. 156—11 **2 Claims**



1. A method of fabricating semiconductor devices comprising the steps of forming a lower layer of Ta_2N on a semiconductor body, forming a metallized layer over the lower layer of Ta_2N, forming an upper layer of Ta_2N over the metallized layer, forming a mask on the upper surface of the upper Ta_2N layer, chemically etching the upper Ta_2N layer to expose portions of the metallized layer, sputter etching the upper Ta_2N layer and the exposed portions of the metallized layer to simultaneously remove the upper Ta_2N layer, the exposed portions of the metallized layer, and the portions of the lower Ta_2N layer beneath the exposed portions of the metallized layer.

3,907,621

METHOD OF SENSITIZING SUBSTRATES FOR CHEMICAL METALLIZATION

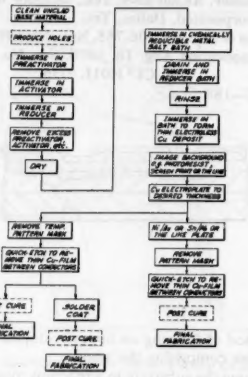
Joseph Polichette, South Farmingdale; Edward J. Leech, Oyster Bay, and Francis J. Nuzzi, Lynbrook, all of N.Y., assignors to Photocircuits, Hartford, Conn.

Continuation-in-part of Ser. No. 167,432, Oct. 29, 1971, Pat. No. 3,772,056. This application Feb. 18, 1972, Ser. No. 227,446The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

Int. Cl. C23c *3/02;* **C23f** *1/00*

U.S. Cl. 156—18 **32 Claims**

1. In a process for making printed circuit boards, a sensitization procedure wherein the steps consist essentially of applying a solution containing a reducible salt of a non-noble metal of the group consisting of metals of Period 4 of Groups IB and VIII of the Periodic Table of Elements directly to a surface of an insulating base and of reducing said salt by a technique of the group consisting of thermal reduction, reduction by radiation and reduction with chemical reducing agents to form a non-conductive layer of free metallic nuclei of said metal on said surface, said nuclei being catalytic for the deposition of


CLEAN INCLAD BASE MATERIAL
PRODUCE HOLES
IMMERSE IN CHEMACTIVATOR
IMMERSE IN ACTIVATOR
IMMERSE IN REDUCER
REMOVE EXCESS REACTIVATOR, ACTIVATOR, etc.
DRY
IMMERSE IN CHEMICALLY REDUCIBLE METAL SALT BATH
DRAIN AND IMMERSE IN REDUCING BATH
RINSE
IMMERSE IN BATH TO FORM THIN ELECTROLESS Cu DEPOSIT
IMAGE BACKGROUND (E.G. PHOTORESIST), DESIGN PRINT OR ETCH LINE
Cu ELECTROPLATE TO DESIRED THICKNESS
REMOVE TEMP. PATTERN MASK
QUICK ETCH TO REMOVE THIN Cu FILM BETWEEN CONDUCTORS
POST CURE
SOLDER COAT
POST CURE
FINAL FABRICATION
Ni OR Sn/Pb OR THE LIKE PLATE
REMOVE PATTERN MASK
QUICK ETCH TO REMOVE THIN Cu FILM BETWEEN CONDUCTORS
POST CURE
FINAL FABRICATION

electroless metal; and thereafter selectively metallizing the sensitized surface of said base.

3,907,622

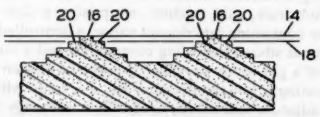
PROCESS FOR FORMING NEGATIVES FOR CHEMICAL ETCHING PROCESS

Jacob A. Otthofer, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 16, 1974, Ser. No. 497,850

Int. Cl.[2] B44C *1/22*

U.S. Cl. 156—58 **4 Claims**



1. A method of forming a three-dimensional surface including the steps of preparing a model of the three-dimensional surface to be duplicated with the material of the model being of a definite shade, coating the surface of the model to be reproduced with a material which is of a contrasting shade, removing from a first plane of the model surface a portion of the contrasting shade coating so as to expose a portion of the underlying model material, photographing the model surface to be reproduced in this condition of exposed areas of a definite shade which is in contrast to the coated areas, removing additional portions of the contrasting shade coating and definite shade model material from a second plane parallel to the first plane to expose more of the definite shade model material underlying the contrasting shade surface coating, photographing this surface configuration, and continuing this sequence of removing in parallel planes additional portions of the contrast shade coating and definite shade model material from the surface of the model to be reproduced and photographing that surface after each removal to secure a series of negatives which provide in effect a series of elevational cross-sectional views of the model surface to be reproduced.

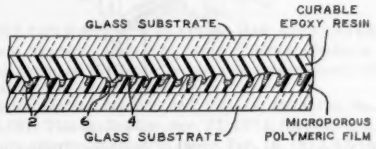
4. The method of claim **3** wherein there is provided a flat surface of etchable material, coating said flat surface with a photo sensitive resist and using one of the above-mentioned negatives for conditioning the photo sensitive resist to coat certain areas of the etchable material and to be removable from other areas of the etchable material, removing the removable resist coating material and placing the etchable mate-

rial in an etching solution to remove a portion of the etchable material not protected by the photo sensitive resist, and repeating the above steps of applying the photo sensitive resist and different above-developed photographic negatives to generate a surface configuration in the etchable material which substantially duplicates the surface configuration of the above-mentioned model.

3,907,623
POLYMER CURING SYSTEM

Rostyslaw Dowbenko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 4, 1973, Ser. No. 347,985
Int. Cl.² C09J *5/02*
U.S. Cl. 156—77 **6 Claims**



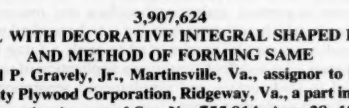
1. A method of bonding two surfaces together comprising:
A. forming on one of said surfaces a polymeric film which contains a plurality of discrete, open voids;
B. charging said voids with a curing agent for an epoxy resin system;
C. providing a layer of curable but uncured epoxy resin system between said charged film and the other of said surfaces;
D. contacting said charged film with said uncured resin system and said uncured epoxy resin system with said other of said surfaces; and
E. curing said epoxy resin system to thereby effect an adhesive bond between the two surfaces.

4. A method of bonding two surfaces together comprising:
A. forming on one side of each of said surfaces a polymeric film which contains a plurality of discrete, open voids;
B. charging said voids with a curing agent for a thermosetting resin system;
C. applying a layer of curable but uncured thermosetting resin to one of said charged films;
D. contacting the other charged film with said uncured thermosetting resin; and
E. curing said thermosetting resin to thereby effect an adhesive bond between the two surfaces.

3,907,624
PANEL WITH DECORATIVE INTEGRAL SHAPED EDGE AND METHOD OF FORMING SAME

Richard P. Gravely, Jr., Martinsville, Va., assignor to Henry County Plywood Corporation, Ridgeway, Va., a part interest

Continuation-in-part of Ser. No. 755,914, Aug. 28, 1968, abandoned. This application June 30, 1972, Ser. No. 268,120
Int. Cl.² B32B *31/30;* **B29C** *1/14*
U.S. Cl. 156—214 **10 Claims**

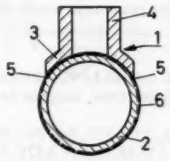


1. The method of forming a panel with a decorative integral shaped edge comprising the steps of sequentially;
a. forming a pheripheral edge on a panel;
b. applying a continuous edge of hardenable material to said peripheral edge of the panel by positioning the panel within a mold cavity having a shaped inner peripheral surface, spacing at least a portion of the periphery of the panel from the surface of the cavity to define a void space free of interruption, sealing the bottom of the cavity, flowing a flowable and hardenable decorative material into the void space into direct contact with the surface of the cavity and the portion of the periphery of the panel spaced therefrom, allowing the material to harden and become integrated with the panel and removing the mold from the integrated panel and hardened decorative material by separation along the surface of the cavity;
c. laminating at least one face to said panel with the peripheral edge of each said laminated face projecting peripherally beyond said applied continuous edge; and
d. final shaping said continuous edge of hardened material and the peripheral edge of each said face.

3,907,625
MEANS FOR WELDING PLASTIC PIPE JOINTS TO PLASTIC PIPES

Kurt Vogelsanger, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Dec. 4, 1972, Ser. No. 311,551
Claims priority, application Switzerland, Dec. 3, 1971, 17578/71
Int. Cl.² B29C *27/02;* **B29D** *9/00*
U.S. Cl. 156—253 **11 Claims**



1. The method of welding a saddle-shaped plastic member onto a pipe of weldable plastic, which comprises:
melting material of a concave surface of the member, melting material of the outer surface of the pipe along an axial length of the pipe while maintaining the structural integrity of the pipe, mounting the concave surface of the member on the pipe at the axial length, and allowing the melted material on the member and the pipe to cool wherein, the step of melting material on the outer surface of the pipe includes melting the material in the circumferential direction of the pipe beyond the circumferential extent of the concave surface of the member when it engages the pipe and completely around the periphery of the pipe and melting the material in the axial direction of the pipe beyond the axial extent of the concave surface of the member in both axial directions when it engages the pipe.

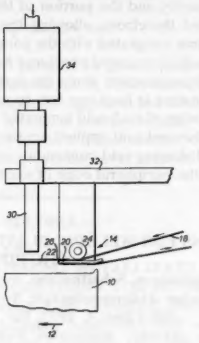
3,907,626
LABELLING DEVICES

John E. Cook, Boston, England, assignor to Norprint Limited, England

Filed May 9, 1973, Ser. No. 358,524
Claims priority, application United Kingdom, May 12, 1972, 72/22317
Int. Cl.² B65C *1/02, 9/28, 9/42*
U.S. Cl. 156—361 **6 Claims**

1. A label-applying apparatus comprising conveyor means for moving a row of articles to be labelled past a label-applying station, means at said label-applying station for dispensing labels successively from a web of labels to float free of support and without application of suction thereto, pneumatic nozzle means at said label-applying station and disposed at the point where each successive label is dispensed from the web, said pneumatic nozzle means directing a blast of air under positive pressure against each freely floating label immediately following its dispensing from the web, for blowing freely floating

labels directly from said dispensing means into adhering relationship with the articles and constituting the only means



exerting a pneumatic force on the dispensed labels, and means for synchronizing operation of the conveying means, the dispensing means and the pneumatic nozzle means.

3,907,627

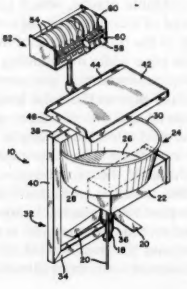
MANUAL LABELLING APPARATUS

Fritz F. Treiber, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Sept. 17, 1973, Ser. No. 398,070

Int. Cl.[2] B65B *67/10*; **A47F** *10/00*

U.S. Cl. 156—538 **9 Claims**



9. Labelling apparatus comprising a pedestal supporting base including a substantially vertically disposed central column and outwardly and downwardly extending, triangularly arranged supporting legs, a tub-like receptacle having a substantially cylindrical side wall rotatably mounted on an upper end of said vertical column, means for rotating said receptacle on said column, a substantially U-shaped frame including upper and lower substantially horizontally oriented legs and a substantially vertically oriented interconnecting leg extending between said upper and lower legs, means attaching an inner end of said lower horizontal leg to said vertical column beneath said receptacle, a substantially rectangular table, means mounting said table on said upper horizontally disposed leg above upper edges of said substantially cylindrical side wall of said receptacle and inwardly thereof, the length and width of said table being less than the diameter of said receptacle, a label dispenser for holding a supply of labels to be applied to packages placed on said table, a substantially L-shaped support having one end thereof attached to said upper horizontal leg of said substantially U-shaped frame beneath said table intermediate the ends thereof, and means attaching said label dispensing means to an opposite end of said L-shaped support.

3,907,628

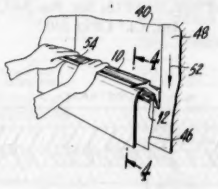
APPLICATOR FOR SELF-ADHESIVE SHEET MATERIAL

Walter E. Buske, Amesbury, Mass., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,532

Int. Cl.[2] B32B *31/20*

U.S. Cl. 156—574 **17 Claims**



1. An applicator for applying to a surface sheet material having on one side thereof a coating of pressure-sensitive adhesive and a removable protective sheet extending over said adhesive coating, said applicator comprising: a longitudinal body, a concavity defined in said body by a wall extending longitudinally therealong, said concavity terminating at a pair of spaced longitudinal borders; a longitudinal slot extending along said body portion and defined between said borders of said concavity; a convex presser edge adjacent said concavity; and a longitudinal guide member located within said concavity and spaced therefrom to permit passage of said sheet material about said guide member and between said guide member and said concavity wall; said concavity being open at at least one of its longitudinal ends; said guide member being arranged within said concavity to define between said concavity wall and said guide member an unobstructed space extending continuously from said open end of said concavity a sufficient distance to permit insertion of said sheet material between said concavity wall and said guide member through said concavity open end; said guide member being arranged as a cantilever supported at one end thereof opposite said concavity open end; said longitudinal slot being configured to permit said sheet material to pass continuously therethrough into said concavity around said guide member and outwardly thereof to between said presser edge and said surface; said presser edge being arranged to apply pressure against said sheet material during application thereof in a continuous manner when said applicator is pressed against said surface and moved in the direction in which said sheet material is to be applied whereby said applicator may be manipulated to apply a force through said presser edge to effect continuous application of said sheet material to said surface and simultaneous separation therefrom of said protective sheet.

15. An applicator for applying to a surface sheet material having on one side thereof a coating of pressure-sensitive adhesive and a removable protective sheet extending over said adhesive coating, said applicator comprising: a longitudinal body, a concavity defined in said body by a wall extending longitudinally therealong, said concavity terminating at a pair of spaced longitudinal borders; a longitudinal slot extending along said body portion and defined between said borders of said concavity; a convex presser edge adjacent said concavity; a supplemental presser surface located on a side of said presser edge opposite said longitudinal slot and extending along said longitudinal body; and a longitudinal guide member located within said concavity and spaced therefrom to permit passage of said sheet material about said guide member and between said guide member and said concavity wall; said longitudinal slot being configured to permit said sheet material to pass continuously therethrough into said concavity

around said guide member and outwardly thereof to between said presser edge and said surface; said presser edge being arranged to apply pressure against said sheet material during the application thereof in a continuous manner when said applicator is pressed against said surface and moved in the direction in which said sheet material is to be applied whereby said applicator may be manipulated to apply a force through said presser edge to effect continuous application of said sheet material to said surface and simultaneous separation therefrom of said protective sheet; said supplemental presser surface being arranged to engage said sheet material subsequent to engagement thereof by said presser edge to facilitate smooth application of said sheet material to said surface when said applicator is moved in the direction in which said sheet material is to be applied.

3,907,629

MULTIPLE EFFECT EVAPORATOR APPARATUS

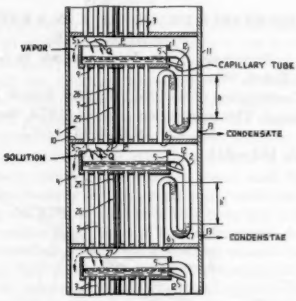
Shunichi Machida; Masaharu Tsujita; Shintaro Nakaya, and Ryoji Ueno, all of Tokyo, Japan, assignors to Ebara Manufacturing Co., Ltd., Tokyo, Japan

Division of Ser. No. 333,035, Feb. 16, 1973, Pat. No. 3,820,581. This application Apr. 22, 1974, Ser. No. 462,928

Claims priority, application Japan, Feb. 16, 1972, 47-16122

Int. Cl. B01d *1/22, 1/26, 3/02*

U.S. Cl. 159—13 A **3 Claims**



1. A multiple effect evaporator apparatus which comprises: a plurality of evaporator chambers disposed in vertical alignment;

a plurality of thin falling internal film type vertically oriented heat exchange tube bundles for increasing evaporation coefficient in each of said evaporator chambers;

said heat exchange tubes being molded to an upper plate at the top ends and to a bottom plate at the lower ends thereof;

a vessel for receiving solution placed above said upper plate in each of said chambers;

pressure difference maintaining means for maintaining difference of pressure between said evaporator chambers in the solution flow path;

a siphon overflow tube having one end thereof connected to an overflow outlet of said vessel above said pressure difference maintaining means at a place controlling the depth of said solution in said vessel and being open to the chamber containing said vessel, and the other end of said tube being connected to the bottom plate above the vessel in the next lower evaporator chamber as an outlet of said solution from said overflow tube to said lower vessel so as to maintain the pressure difference between the upper and lower chambers, whereby an overflow from said vessel over its brim to said bottom plate of its condensing chamber is prevented so as to prevent contamination of the resulting condensate with said solution; and

said overflow tube receiving said solution under a differential head so as to overflow said solution, regardless of the pressure difference in each chamber.

3,907,630

METHOD OF FIBER BOARD ARTICLE PRODUCTION EMPLOYING PREDRYING OF THE LIGNO-CELLULOSIC MATERIAL PRIOR TO LIQUID SUSPENSION AND ARTICLE FORMATION, AND EMPLOYING WATER RECIRCULATION

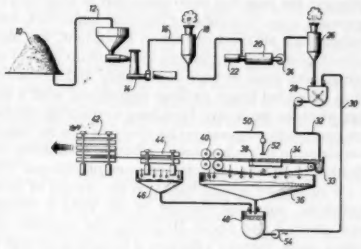
Stig Selander, Stockholm, Sweden, assignor to Defibrator AB, Stockholm, Sweden

Continuation of Ser. No. 217,109, Jan. 12, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 418,005

Claims priority, application Sweden, Jan. 20, 1971, 669/71

Int. Cl. D21c *9/18;* **D21f** *1/66;* **D21j** *3/00*

U.S. Cl. 162—13 **4 Claims**



1. in the method of producing formed bodies of lignocellulose-containing material comprising the steps of (a) defibering the material in at least one stage, (b) forming the defibered material into a suspension thereof in water, said water serving as propellant liquid for the defibered material, (c) forming blanks for shaped articles from said suspension by mechanically separating and pressing water in liquid phase from said suspension, and (d) thereafter subjecting the blanks to final drying under heat and mechanical pressure, the improvement which comprises subjecting the defibered material, prior to said suspension-forming step (b) to a pre-drying action with a gaseous heating medium to a condition in which its dry content is brought to a level which is at least equal to or higher than the dry content of said blanks after mechanical separation of water in said forming step (c) so that water is removed substantially only in steam phase during said drying step (d) while substantially all water separated from said suspension in said forming step (c) is recirculated to the suspension-forming step (b).

3,907,631

METHOD OF PERFORMING A SURGE-BOIL STEP DURING THE HEATING PERIOD OF A LIGNOCELLULOSIC MATERIAL COOKING STAGE

Sture Olof Erik Backlund, Sundsvall, Sweden

Continuation-in-part of Ser. No. 209,883, Dec. 20, 1971, Pat. No. 3,793,137. This application June 8, 1973, Ser. No. 368,032

Claims priority, application Sweden, May 14, 1973, 7306760The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl.[2] D21C *7/12*

U.S. Cl. 162—42 **1 Claim**

1. In a method of improving the homogeneity in periodic cooking of lignocellulosic material in a digester including a heating stage and having a heating system constructed in a manner to permit steam to be supplied directly to the bottom of the digester wherein at least one surge-boil step having a duration of from 10 minutes to 5 seconds is carried out, during the heating period of the cooking stage at a point of time when

the chlorine number of the pulp is 30–20, by pressure reduction in the digester, said pressure reduction being obtained by carrying out at least one of the steps of (a) removing gas from the top of the digester and (b) supplying cooling liquid to the top of the digester, the improvement which consists in enhancing the surge-boil step by simultaneously with the pressure reduction directly supplying steam to the digester bottom in an amount of at least 0.1 ton steam/minute.

3,907,632
BLEACHING CELLULOSIC PULPS WITH GASEOUS CHLORINE AT A pH OF 7 TO 10 IN A MULTISTAGE BLEACHING PROCESS

Claud B. Christiansen, and William R. Dial, both of Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 23, 1973, Ser. No. 408,770
Int. Cl.² D21C *9/12*
U.S. Cl. 162—66 **17 Claims**

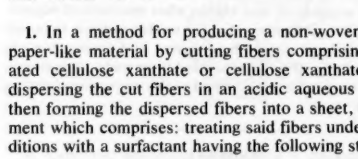
1. In a multistage process for bleaching a fibrous cellulosic pulp wherein the pulp has been subjected at least to a chemical treatment stage to solubilize ligneous impurities, followed by a subsequent alkaline extraction treatment, the improvement which comprises contacting the resultant pulp in at least one subsequent stage at high consistency and in the form of fluffed or shredded fibers or fiber aggregates, with a gaseous medium wherein the active bleaching contacting component consists essentially of gaseous chlorine wherein the amount of gaseous chlorine in each gaseous chlorine contacting stage is an effective bleaching inducing amount of chlorine which is about 1% or less by weight based on the weight of moisture-free cellulosic pulp and the pH of the pulp is maintained between about 7 and about 10 during the gaseous chlorine contacting stage, thereby effecting a bleaching of said pulp.

3,907,633
DISPERSING CELLULOSE XANTHATE FIBERS IN AN ACIDIC AQUEOUS MEDIUM CONTAINING A CATIONIZED ALKYL BETAINE SURFACTANT

Migaku Suzuki, Ohtake; and Atushi Kawai, Hiroshima, both of Japan, assignors to Mitsubishi Rayon Co. Ltd., Tokyo, Japan

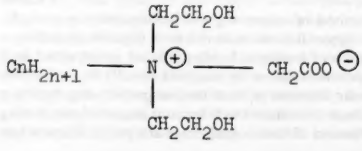
Filed June 13, 1974, Ser. No. 479,038
Claims priority, application Japan, June 18, 1973, 48/68505
Int. Cl.² D21H *3/12*
U.S. Cl. 162—157 C **4 Claims**

1. In a method for producing a non-woven fabric or a paper-like material by cutting fibers comprising unregenerated cellulose xanthate or cellulose xanthate derivative, dispersing the cut fibers in an acidic aqueous medium and then forming the dispersed fibers into a sheet, the improvement which comprises: treating said fibers under acidic conditions with a surfactant having the following structure:



(a)

or



(b)

wherein n is an integer of 12–18, which surfactant is cationized by acidification, so as to impart good self-dispersibility to said fibers.

3,907,634
PROCESS FOR SMOOTHING WATER-FELTED ARTICLES

David G. Izard, Hoffman Estates, and Robert E. Fredericksen, McHenry, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 430,001
Int. Cl.² D21F *11/00;* **D21H** *5/06*
U.S. Cl. 162—204 **3 Claims**

1. In a process for making smooth water-felted fiberboard, including the steps of

mixing a slurry of fibers, felting the slurry upon a moving foraminous screen, dewatering the slurry upon the screen so as to form a wet mat of fibers, and drying the mat to form a board-like product;

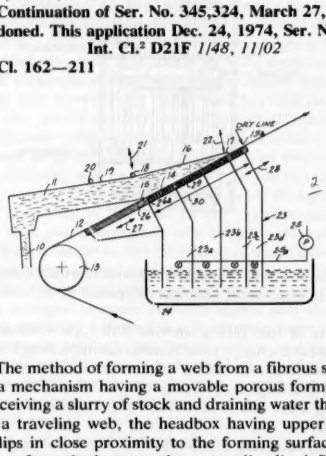
the improvement comprising, prior to said drying step, repeatedly contacting successive transverse portions of a surface of the wet mat with a free-floating substantially solid metal roller having a diameter no greater than about 1 inch,

whereby the surface of the mat is rendered smooth without materially increasing the density of the mat.

3,907,635
ADJUSTABLE DRAIN PLATE IN A PAPER WEB FORMING ZONE

David J. Bringman, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 345,324, March 27, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,233
Int. Cl.² D21F *1/48, 11/02*
U.S. Cl. 162—211 **9 Claims**



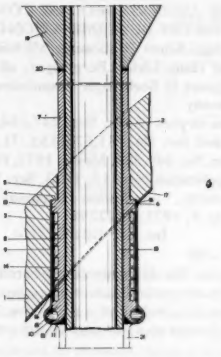
1. The method of forming a web from a fibrous stock slurry with a mechanism having a movable porous forming surface for receiving a slurry of stock and draining water therefrom to form a traveling web, the headbox having upper and lower slice lips in close proximity to the forming surface with the distance from the lower to the upper slice lip defining a machine direction slice opening along the forming surface and the machine direction distance from the location where the water begins draining from the stock to the dry line defining a drainage zone, and having a drain plate means with an imperforate portion and a perforate portion opposite the slice opening with the imperforate portion blocking the slice opening to prevent flow through the forming surface with the imperforate portion being of sufficient length to block the drainage zone for substantial lengths, the method including the steps of determining the dry line by blocking the forming surface for a substantial distance beyond the lower slice lip to control the length of the drainage zone by moving the plate to change the distance the imperforate portion extends in the machine direction to block controlled lengths of the slice opening to position the dry line a predetermined distance beyond the upper slice lip.

3,907,636

PIPE PENETRATION STRUCTURE FOR A NUCLEAR REACTOR

Walter Swart, Delft, Netherlands, assignor to De Rotterdamsche Droogdok Maatschappij B.V., Rotterdam, Netherlands

Filed Nov. 15, 1972, Ser. No. 306,834
Int. Cl. G21c *13/00*
U.S. Cl. 176—87 11 Claims



1. A pipe penetration structure in the wall of a nuclear reactor vessel to enable flooding a hot core of the reactor in the event of emergency or accident by passing a cooling liquid through the wall, the structure comprising in combination: a nuclear reactor vessel having a wall for receiving said penetrating structure, a stepped bore in said wall, the step of said stepped bore providing a transition between a narrow bore section and a wide bore section, a bushing extending into and through said bore and into the reactor vessel, said bushing comprising a first bushing section connected to said wall in the region defining the narrow section of said bore and a second wider bushing section engaging said wall in the region defining the wide section of said bore, said first and second bushing sections having therebetween a stepped section which abuts the step of said stepped bore, said second section being a double walled section comprising an inner wall continuous with said first bushing section and being of a first thickness, and a thinner outer wall originating within the wide bore section and in contact therewith, means associated with said inner wall for supporting said outer wall along its length and for maintaining said outer wall in continuous contact with said wide bore section, said inner and outer walls projecting into and terminating within the reactor vessel in a thin circular transition joint having a weld seam sealing said inner and outer walls at and around said transition joint, a very thin seal weld joint securing the outer wall of said bushing to the vessel wall on the inside thereof, said thin circular transition joint defining a flexible joint in which the outer thinner wall flexes to tolerate the temperature differential between cooling liquid and the hot interior of the reactor vessel without unduly stressing said thin seal weld joint.

3,907,637

PROCESS FOR THE PRODUCTION OF L-LYSINE

Kiyoshi Nakayama, Sagamihara; Mamoru Kohata, Kawasaki; Yoshitake Tanaka, Machida; Tadaaki Nomura, Tokyo, and Ryoichi Katsumata, Maebashi, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,424
Claims priority, application Japan, Apr. 10, 1973, 48-40043
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 6 Claims

1. A process for the production of L-lysine which comprises culturing a mutant strain belonging to the genus Protaminobacter, said mutant being capable of utilizing methanol and capable of growing in the presence of at least 10mg/ml of S-2-aminoethyl-L-cystein and at least 20mg/ml of L-threonine, in a nutrient medium containing methanol as a main source of carbon, accumulating L-lysine in said medium and thereafter isolating said L-lysine.

3,907,638

SELECTIVE DEACYLATION OF N-ACYL-DL-AMINO ACIDS

Teruo Uzuki; Mayumi Takahashi, both of Kawasaki; Misa Noda, Tokyo; Yoshioki Komachiya, Yokohama, and Hachiro Wakamatsu, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,712
Claims priority, application Japan, Apr. 24, 1973, 48-46472
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 11 Claims

1. In a method of preparing an optically active amino acid from a racemic N-acyl derivative of said amino acid, the acyl group being the acyl radical of a carboxylic acid, wherein said racemic N-acyl derivative is attacked by acylase in an aqueous medium until said racemic N-acyl derivative is partly deacylated to an optically active enantiomorph of said amino acid, and an optically active enantiomorph of said N-acyl derivative and said carboxylic acid are formed, the improvement which comprises:

a. contacting said medium during said attacking with an organic solvent not miscible with said medium,
b. the respective equilibrium concentrations of said racemic N-acyl derivative and of said carboxylic acid in said solvent being at least equal to the corresponding concentrations in said medium, and
c. the pH value of said medium being lower than 7.

3,907,639

METHOD FOR PRODUCING 2-KETO-L-GULONIC ACID

Shraga Makover, Verona, and David Louis Pruess, Passaic, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 31, 1972, Ser. No. 285,265
Int. Cl.[2] C12D *1/06*
U.S. Cl. 195—36 R 25 Claims

1. A process for the preparation of 2-keto-L-gulonic acid from L-sorbosone comprising enzymatically transforming sorbosone to 2-keto-L-gulonic acid by the action of an enzyme system of a microorganism capable of converting L-sorbosone to 2-keto-L-gulonic acid selected from the group consisting of the following genera:

Acetobacter;
Pseudomonas;
Escherichia;
Serratia;
Bacillus;
Staphylococcus;
Aerobacter;
Alcaligenes;
Gluconobacter;
Candida; and
Penicillium.

3,907,640

PRODUCTION OF ALKALI METAL GLUCONATES

Donald Lee Gillenwater, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed Aug. 8, 1973, Ser. No. 386,785
Int. Cl.[2] C12D *1/06*
U.S. Cl. 195—36 R 5 Claims

1. A process which comprises subjecting to spray drying a crystal-containing solution of an alkali metal gluconate containing crystals in an amount of about 5 to 50% by volume and recovering a substantially dry alkali metal gluconate.

5. In the process of producing alkali metal gluconate salts wherein fermentation of glucose with microorganisms is effected to produce gluconic acid and the so-produced gluconic acid is converted to a salt by neutralization with an alkali metal base, the improvement which comprises causing the formation of crystal growth in the fermentation liquor containing an alkali metal gluconate to provide a crystal concentration of from about 5 to about 50% by volume and spray drying the said crystal-containing fermentation liquor.

3,907,641

PROCESS FOR PRODUCING AMINO ACIDS BY FERMENTATION

Kiyoshi Nakayama, Sagamihara; Mamoru Kohata, Kawasaki; Yoshitake Tanaka, Machida; Tadaaki Nomura, Tokyo, and Ryoichi Katsumata, Maebashi, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,423

Claims priority, application Japan, Apr. 10, 1973, 48-40043

Int. Cl. C12d *13/06*

U.S. Cl. 195—49 **5 Claims**

1. A process for producing L-lysine, L-aspartic acid, L-alanine, L-valine, L-leucine and L-arginine which comprises culturing *protaminobacter thiaminophagus* ATCC 21927 in a nutrient medium containing methanol as the carbon source under aerobic conditions, accumulating L-lysine, L-aspartic acid, L-alanine, L-valine, L-leucine and L-arginine in the medium and isolating at least one of said amino acids.

3,907,642

CHOLESTEROL OXIDASE AND METHOD OF EXTRACTING FROM NOCARDIA

William Richmond, Harrow, England, assignor to National Research Development Corporation, England

Filed Sept. 15, 1972, Ser. No. 289,581

Claims priority, application United Kingdom, Sept. 22, 1971, 44095/71; June 11, 1972, 28650/72

Int. Cl. C07g *7/028*

U.S. Cl. 195—62 **21 Claims**

1. An enzyme preparation useful for the enzymatic determination of the amount of cholesterol in a given sample, said enzyme preparation being derived from Nocardia species NCIB 10554 (NRRL 5635) or NCIB 10555 (NRRL 5636), by growing said Nocardia species in a suitable medium and recovering the enzyme preparation which is characterized by having a cholesterol oxidase specific activity of at least 1 unit per 5 mg of protein nitrogen and capable of oxidizing cholesterol to Δ^4 cholestenone and hydrogen peroxide.

3,907,643

PROCESS FOR PRODUCING THE ANTIBIOTIC U-44,590

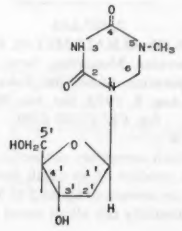
Clarence DeBoer, and Brian Bannister, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 471,322, May 20, 1974. This application Jan. 15, 1975, Ser. No. 541,346

Int. Cl.[2] C12D *9/00*

U.S. Cl. 195—80 R **3 Claims**

1. A process for preparing antibiotic U-44,590 having the structure



which comprises cultivating *Streptomyces platensis* var. *clarensis*, having the identifying characteristics of NRRL 8035, in an aqueous nutrient medium under aerobic conditions until substantial antibiotic activity is imparted to said medium by the presence of antibiotic U-44,590.

3,907,644

CREATININE AMIDOHYDROLASE COMPOSITION AND PROCESS FOR THE DETERMINATION OF CREATININE

Hans Mollering; Klaus Beaucamp; Michael Nelboeck-Hochstetter, and Hans Ulrich Bergmeyer, all of Tutzing, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Continuation-in-part of Ser. Nos. 247,184, April 24, 1972, abandoned, and Ser. No. 411,526, Oct. 31, 1973, which is a division of Ser. No. 249,589, May 2, 1972, Pat. No. 3,806,416. This application Nov. 13, 1973, Ser. No. 415,463

Claims priority, application Germany, May 5, 1971, 2122255; May 5, 1971, 2122298

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—99 **25 Claims**

1. Process for the determination of creatinine, which process comprises incubating a creatinine-containing sample with creatinine amidohydrolase at a pH above 7 and determining the creatine formed as a measure of the creatinine present in the sample.

22. Reagent composition for the specific determination of creatinine, which composition comprises

a. a creatinine standard

b. picric acid

c. an aqueous solution of sodium hydroxide

d. creatinine amidohydrolase.

3,907,645

CHOLESTEROL ASSAY

William Richmond, Middlesex, England, assignor to National Research Development Corporation, England

Division of Ser. No. 289,581, Sept. 15, 1972. This application Jan. 23, 1974, Ser. No. 435,892

Claims priority, application United Kingdom, Sept. 22, 1971, 44095/71; June 19, 1972, 28650/72

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 R **46 Claims**

1. A method of assaying for cholesterol in a liquid which comprises incubating said liquid with an enzyme preparation capable of oxidising cholesterol into Δ^4-cholestenone and hydrogen peroxide and determining the amount of cholesterol present in said liquid by measuring the amount of hydrogen peroxide produced.

3,907,646

MEASUREMENT OF GAS PRODUCTION OF MICROORGANISMS

Judd R. Wilkins, Hampton; Albin O. Pearson, Grafton, and Stacey M. Mills, Hampton, all of Va., assignors to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel, Washington, D.C.

Filed July 24, 1974, Ser. No. 491,416

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—103.5 R **6 Claims**

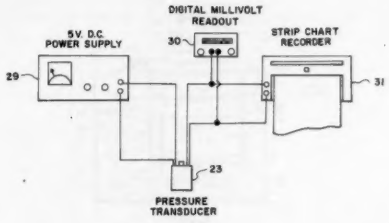
1. A method of quantifying the number of gas-producing microorganisms in a liquid sample comprising:

diluting a specific quantity of a liquid sample believed to contain gas-producing mircroorganisms in a broth known to permit growth of gas-producing microorganisms,

incubating the diluted sample under temperature and pressure conditions known to stimulate gas-producing microorganism growth, for a specific period of time,

measuring the gas pressure produced by the incubated sample over an extended period of time in terms of an electrical signal,

recording a plot of the electrical signal produced by the gas pressure over an extended period of time,



wherein the recorded signal plot indicate a curve showing an initial lag period in which substantially no gas is evolved, followed by a rapid increase in pressure to a leveling off of pressure and wherein the lag period, the slope of the increase in pressure curve and the height of the level portion of the curve are all indicative of the number of microorganisms in the sample being tested.

3,907,647

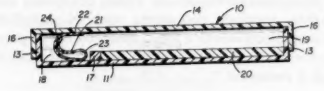
COMBINATION PETRI DISH AND ISOLATOR

Dewey S. C. Sanderson, 4890 Troy St., Denver, Colo. 80239

Filed Aug. 15, 1973, Ser. No. 388,550

Int. Cl. C12k *1/10*

U.S. Cl. 195—139 **3 Claims**



3. A combination petri dish and isolator for culturing micro-organisms and the like comprising

a. a container consisting of a lower box-like member and a cover therefor,

b. an isolator on the cover extending downwardly into the lower member of the container, and

c. a partition in the lower member dividing the member into a storage chamber for reception of the isolator and a larger chamber containing culture media,

d. said cover being liftable to be movable over said lower member with the isolator in spreading contact with the culture media for spreading micro-organisms deposited thereon, said isolator being flexible, permitting deformation for storage in the storage chamber when the cover is in its lower position on the container lower member, and automatic extension into media contacting form when the cover is raised for movement over the media in the container lower member.

3,907,648

METHOD OF MANUFACTURING FORMED COKE FOR BLAST FURNACES WITHOUT CAUSING THE FUSION OF THE COKE

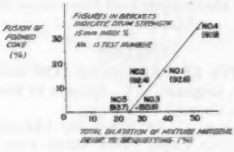
Naomichi Nire, Takatsuki, and Takeo Sakai, Nagareyama, both of Japan, assignors to Sumitomo Metal Industries Ltd. and Keihan Rentan Kogyo Co., Ltd., both of, Japan

Filed Feb. 26, 1973, Ser. No. 335,868

Claims priority, application Japan, Feb. 29, 1972, 47-21240

Int. Cl.[2] C10B *45/02;* **C10L** *5/00;* **C10B** *53/00*

U.S. Cl. 201—6 **3 Claims**



1. A method of manufacturing a blend of coal materials for use in producing formed coke for blast furnaces from a blend of different materials without causing the fusion of the coke, the blend being composed of 70 to 90 percent by weight of poor coking and non-coking coal as the main material, 20 to 0 percent by weight of auxiliary material including inert carbon substance and coking coal and 10 percent by weight of a binder so as to make the total of the blend material 100 percent, including blending various proportions of the different materials until both the average value of the total dilatation of the blend prior to briquetting is held to less than 27 percent and the Trrommel strength of the coal briquette is held to more than 92 percent.

3,907,649

ELECTROPLATING OF THE CUT EDGES OF SHEET METAL PANELS

Otto Alfred Becker, 59 Robert Koch Strasse, D-6600 Saarbrucken 6, Germany

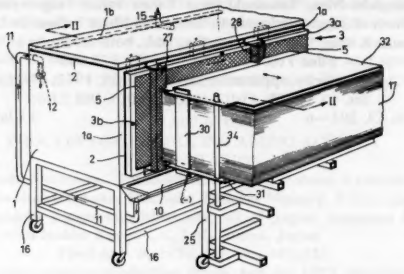
Continuation of Ser. No. 204,390, Dec. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 835,116, June 20, 1969, abandoned. This application Sept. 14, 1973, Ser. No. 397,257

Int. Cl. C23b *5/48;* **B23p** *1/02;* **C23b** *5/76*

U.S. Cl. 204—15 **16 Claims**

1. In a method of electroplating the cut edges of sheet metal panels, the improvement which consists in forming a pile of said panels, inserting one side of said pile through an opening in the wall of an electroplating container, said opening being sealed in a liquid-tight manner around said pile, introducing the electrolyte into said container so as to cause contact of the cut edges of said pile of sheet metal panels with the electro-

lyte, connecting each panel of said pile with an electroplating current source, performing electroplating of said cut edges,



removing the electrolyte from said container, and withdrawing the pile with the electroplated cut edges from the container.

3,907,650

PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY

Heinz W. Pinsler, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 12, 1973, Ser. No. 332,044

Int. Cl.[2] C25D *11/34*; **C09K** *13/04*; **G03C** *3/36*; **G03G** *5/04*

U.S. Cl. 204—34 **12 Claims**

1. In a process for producing a photoreceptor element comprising a nickel or nickel-coated substrate and a photoconductive layer joined in good blocking and charge-injection preventing contact with the substrate through at least two intermediate nickel oxide blocking layers arranged between the substrate and the photoconductive layer the improvement comprising

microetching and chemically oxidizing the nickel or nickel-coated substrate with a composition comprising an inorganic acid selected from the group consisting of phosphoric acid, sulfuric acid and hydrochloric acid, in the presence of at least one of palladium chloride, chloroplatinic acid, or ferric sulfate;

anodically oxidizing the resulting microetched chemically oxidized substrate; and

depositing a selenium-containing photoconductive layer upon the treated substrate to obtain the desired photoreceptor element.

3,907,651

METHOD FOR THE MOLTEN SALT ELECTROLYTIC PRODUCTION OF METALS FROM METAL CHLORIDES AND ELECTROLYZER FOR CARRYING OUT THE METHOD

Knut Anton Andreassen, and Kjell Björn Stiansen, both of Porsgrunn, Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Filed Jan. 29, 1974, Ser. No. 437,608

Claims priority, application Norway, Jan. 30, 1973, 371/73

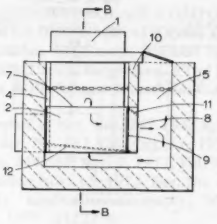
Int. Cl. C22d *3/08*, *3/02*; **B01k** *3/04*

U.S. Cl. 204—70 **9 Claims**

1. A process for the molten salt electrolysis of metal chlorides, preferably for the molten salt electrolytic production of magnesium, said process comprising:

providing an electrolyzer including alternately arranged anodes and cathodes of the double-acting type, each cathode having opposite electrolytically active surfaces each facing corresponding electrolytically active surfaces of separate of said alternately arranged anodes; electrolysis zones between said facing cathode and anode surfaces; at least one gas separation zone positioned above and in communication with said electrolysis zones; a metal separation and collection zone separated from said electrolysis and gas separation zones; and passage means in each said cathode, spaced from said opposite electrolytically active surfaces thereof, for connecting the top of the respective said electrolysis zone with said metal separation and collection zone;

causing electrolyte, gas and metal to flow upwardly through said electrolysis zones;



causing said gas to continue to flow upwardly into said gas separation zone, while deflecting said electrolyte and said metal downwardly, in a direction opposite to the direction of flow of said gas, into said passage means within said electrodes;

passing said electrolyte and metal through said passage means into said metal separation and collection zone;

allowing said metal to rise and separate from said electrolyte in said metal separation and collection zone; and

returning said electrolyte to said electrolysis zones.

3,907,652

ELECTROOXIDATION OF PHOSPHONOMETHYL AMINES

John H. Wagenknecht, Kirkwood, and Kurt Moedritzer, Webster Groves, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 30, 1974, Ser. No. 519,316

Int. Cl.[2] C25B *3/02*

U.S. Cl. 204—79 **11 Claims**

1. The process of removing a phosphonomethyl group from an N-phosphonomethylamine which comprises subjecting an electrolysis medium containing such N-phosphonomethylamine to an electromotive force whereby the N-phosphonomethylamine is oxidized and an N-phosphonomethyl group thereof is removed.

3,907,653

PROCESS FOR RECOVERING TIN SALTS FROM A HALOGEN TIN PLATE SLUDGE

Richard E. Horn, Pittsburgh, Pa., assignor to Pitt Metals and Chemicals, Inc., Pittsburgh, Pa.

Filed Feb. 6, 1975, Ser. No. 547,730

Int. Cl.[2] C25B *1/24*; **C25D** *3/30*; **C25B** *7/00*

U.S. Cl. 204—94 **14 Claims**

1. A process for recovering a tin salt suitable for use in a tin plating bath from the sludge of a halogen tin plating bath comprising,

obtaining a sludge from a halogen tin plating bath that contains sodium fluostannate,

reacting the sodium fluostannate with a basic solution and forming tin hydroxide and an electrolyte solution containing fluoride ions,

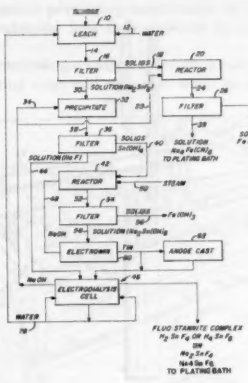
converting the tin hydroxide to metallic tin,

positioning the metallic tin as a soluble anode in an electrodialytic cell,

introducing said electrolyte solution containing fluoride ions into the electrodialytic cell anode compartment containing the soluble metallic tin anode,

passing a current through the electrodialytic cell and generating a solution containing a fluostannite complex ion in

the anode compartment containing the metallic tin soluble anode, and



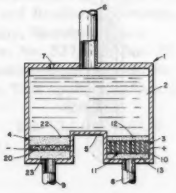
recovering a solution containing the fluostannite complex ion suitable for use in a tin plating bath.

3,907,654

ELECTROLYTIC CELL AND PROCESS FOR ELECTROLYZING SODIUM SULFATE

Frederick J. Radd, and Donald H. Oertle, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Sept. 6, 1973, Ser. No. 394,698
Int. Cl. C01d *1/06*
U.S. Cl. 204—98 **10 Claims**



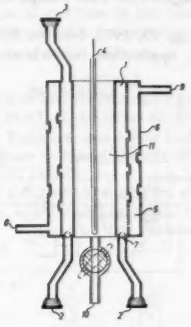
1. An electrolytic cell comprising a housing having a parent solution chamber and a parent solution inlet, an anode compartment and a cathode compartment located separate from but adjacent to said parent solution chamber, each of said anode compartment and said cathode compartment being separated from each other and in direct communication with said parent solution chamber; said anode compartment having an anode mounted therein for generating an anolyte solution and an anolyte solution outlet; said cathode compartment having a cathode mounted therein for generating a catholyte solution and a catholyte solution outlet; each of said anode and cathode being horizontally disposed within its compartment between said parent solution chamber and said respective anolyte or catholyte solution outlet and being porous so that the respective anolyte solution or catholyte solution may pass therethrough and be withdrawn from the electrolytic cell.

3,907,655

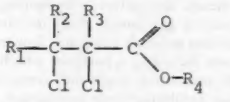
PROCESS FOR THE ADDITIVE CHLORINATION OF α-UNSATURATED CARBOXYLIC ACIDS AND ESTERS

Julien Mulders, Dworp, and Noel Vanlautem, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

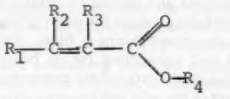
Filed Oct. 30, 1973, Ser. No. 411,174
Claims priority, application Luxembourg, Nov. 10, 1972, 66455
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 HA **15 Claims**



1. Process for the manufacture of a compound of the general formula



by chlorination in the liquid phase, by chlorine, of an α-unsaturated compound corresponding to the formula



in which R_1, R_2 and R_3 independently represent a hydrogen atom or an alkyl group or an aryl group or a chlorine or fluorine atom, provided that at least one of R_1, R_2 and R_3 is a hydrogen atom, and in which R_4 represents a hydrogen atom or a substituted or unsubstituted alkyl or aryl group, comprising reacting the α-unsaturated compound with chlorine in the simultaneous presence of electromagnetic radiation and of a metal compound catalyst.

3,907,656

PROCESS FOR ULTRAVIOLET PIGMENTED HARDENING OF PIGMENTED PAINT FILMS

Antonio de Souza, Akron, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 197,981, Nov. 11, 1971, abandoned. This application May 24, 1974, Ser. No. 472,980
Int. Cl.² C08F *8/00;* **C08G** *18/00;* **C08F** *2/46*
U.S. Cl. 204—159.16 **1 Claim**

1. In a process for ultraviolet curing of a paint film containing titanium dioxide pigment and an ultraviolet sensitizer, and having an acrylic binder polymerizable by free radical-induced addition polymerization when irradiated with ultraviolet radiation, the improvement which comprises:

providing between about 25 to 90% of the opacification of said paint film by the inclusion of granules to entrap

preformed opacifying gas bubbles within said paint film said paint film having a pigment-binder ratio of 0.8/1; and irradiating said paint film with ultraviolet energy radiation until said paint film is cured to a hard paint film.

3,907,657

GAS ANALYSIS APPARATUS

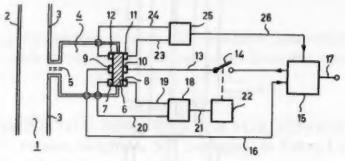
Leopold Heijne; Nicolaas Marinus Beekmans; Petrus Jacobus Poolman, and Ronald Karel Eijnthoven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,682

Claims priority, application Netherlands, July 9, 1973, 7309537

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 S **16 Claims**



1. A gas analysis apparatus for measuring the concentration of a gaseous component in a first space comprising, a chamber having wall means that define a measuring space which receives a measuring gas sample from the first space via connecting means that presents a high gas flow transfer resistance, said wall means including a partition which is part of a wall section of the measuring space and comprising at least one solid substance exhibiting ionic conduction, first and second electrode layers affixed to opposite sides of said partition for receiving an electric current, so that by means of a current of ions in the partition the gaseous component is removed from the measuring space, a control unit for applying an electric current to said first and second electrodes during a pumping time t_p and including means for interrupting the flow of current to said electrodes during a filling time t_f, the transfer resistance of said connecting means being chosen so that, owing to diffusion, the ratio of the concentrations of the gaseous component in the said two spaces is brought to a substantially unity value during the filling time, and the control unit for the electric current further comprises means for applying an electric current to said electrodes after the filling time and during a pumping time t_p such that the ratio of the gas concentrations becomes substantially zero.

3,907,658

ANODE FITTING

Thomas R. B. Watson, Toronto, Canada, assignor to Corrosion Service Company Limited, Toronto, Canada

Filed Aug. 2, 1974, Ser. No. 493,877

Int. Cl.[2] C23F *13/00*

U.S. Cl. 204—197 **13 Claims**

1. An anode fitting for a water tank, comprising:

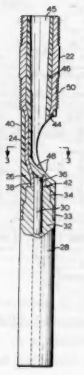
a straight tubular connector member having an upper end and a lower end, and adapted to be secured to a wall of the water tank in electrical contact therewith,

a fluid passageway in said connector member having a straight upper end capable of receiving a stiff rod-like cleaning implement,

an electrode,

means effecting electrical contact between the lower end of said connector member and said electrode,

and fluid-tight protective material lining the interior of said connector member, enclosing said means effecting electrical contact, and defining an opening at the lower end of said fluid passageway, said opening being adjacent said means and including a sloping, deflecting bottom surface which is oriented obliquely to the axis of the connector



member such that a cleaning implement inserted into said upper end of the fluid passageway can clear a plug of deposit through said opening.

3,907,659

COMPOSITE ELECTRODE AND METHOD OF MAKING SAME

Peter M. Paige, Placentia, and Emil S. Scherba, Anaheim, both of Calif., assignors to Holmes & Narver, Inc., Anaheim, Calif.

Filed Apr. 4, 1974, Ser. No. 457,787

Int. Cl. B01k *3/04, 3/06*

U.S. Cl. 204—290 F **6 Claims**

1. A composite electrode comprising a pair of opposing sheets of titanium spaced apart in a central portion and sealed around their edges to form an envelope, and a mass of pieces of a metal having a substantially greater electrical conductivity than that of titanium disposed in a compressed state within the envelope.

3,907,660

APPARATUS FOR COATING GLASS

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 241,543, April 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 60,002, July 31, 1970, abandoned. This application Jan. 3, 1974, Ser. No. 430,424

Int. Cl. C23c *15/00*

U.S. Cl. 204—298 **6 Claims**

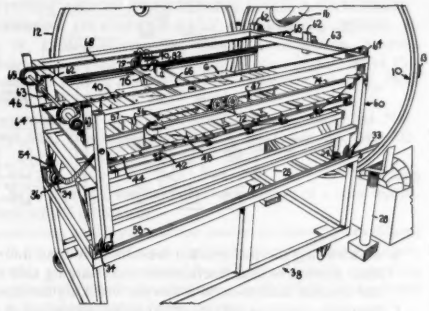
1. An apparatus for applying a uniform, transparent, metal-

containing, electronconductive coating to a substrate comprising:

a. means for providing a low pressure atmosphere not exceeding 10^{-4} torr and containing a mixture of oxygen and an inert gas;

b. means for supporting a substrate within said low pressure atmosphere by supporting said substrate at a plurality of support points permitting substantially all of the surfaces of said substrate free from contact by said supporting means;

c. means comprising a cathode and an anode for sputtering said coating onto said substrate while its temperature is



elevated substantially, said cathode sputtering means having its cathode spaced from and in facing relation to said supporting means; and

d. means for radiantly heating said substrate to a substantially elevated temperature and for maintaining such elevated substrate temperature during cathode sputtering, said radiant heating means being spaced from and in facing relation to said supporting means such that said support means is disposed between said cahode and said radiant heating means, and said radiant heating means comprising means for radiating heat toward substantially all the area embraced by said supporting means.

3,907,661

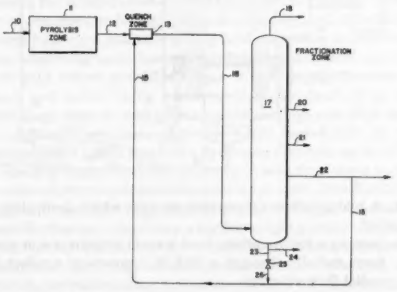
PROCESS AND APPARATUS FOR QUENCHING UNSTABLE GAS

John E. Gwyn, Pasadena, Tex.; Lisle L. Baldwin, Berkeley, Calif., and Howard Brodhead, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 327,285, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 887,011, Dec. 22, 1969, abandoned. This application Dec. 28, 1973, Ser. No. 429,312

Int. Cl.[2] C10G *9/16*

U.S. Cl. 208—48 Q **9 Claims**



1. A method for quenching the effluent from a hydrocarbon pyrolysis unit from a temperature in excess of 1400°F to a temperature at which the effluent is stable, which comprises:

a. passing said effluent through a conduit, and

b. introducing as the sole quenching fluid a refractory, highly aromatic hydrocarbon quench liquid through the wall of said conduit in a manner such that the ratio of radial momentum of quench liquid to the momentum of the effluent passing through the conduit is less than unity, thereby abruptly forming a continuous liquid film on the conduit wall at a temperature below the dew point of the effluent, said quench liquid being introduced into the conduit in the form of the continuous liquid film in an amount sufficient to both cool the effluent to oa temperature at which it is stable and to maintain a continuous liquid film on all portions of the conduit wall until the effluent reaches a stable temperature.

3,907,662

PROCESS OF PREPARING DESULFURIZED LIGHT OIL AND FUEL GAS FROM HEAVY OIL

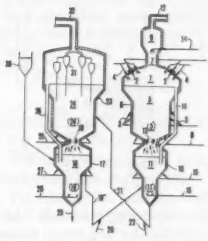
Takeshi Kubota, Fujiidera, and Mikio Ueda, Takatsuki, both of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,427

Claims priority, application Japan, Feb. 15, 1973, 48-17905

Int. Cl. C10g *9/32*

U.S. Cl. 208—53 **4 Claims**



1. In a process of preparing desulfurized light oil and fuel gas from heavy oil by using an alkali metal carbonate compound, the improvement comprising the steps of converting raw material heavy oil in a low temperature coking reactor operating at a temperature of from 470° to 550°C and including a fluidized bed containing particles of an alkali metal carbonate compound into particles of carbonaceous residue containing desulfurized decomposition gas, desulfurized light oil, particles of said alkali metal carbonate compound and an appreciable quantity of volatile components; simultaneously fixing a portion of the sulfur contained in said raw material heavy oil to form an alkali metal sulfide by the action of said alkali metal carbonate compound to recover said desulfurized decomposition gas and said desulfurized light oil from said low temperature coking reactor; transferring said particles of carbonaceous substance residue containing said alkali metal carbonate compound from said low temperature coking reactor into a high temperature coking reactor including a high temperature fluidized bed; treating at an elevated temperature said carbonaceous substance residue in said high temperature fluidized bed operating at a temperature of from 550° to 700° C, forming coke particles containing said alkali metal carbonate compound and desulfurized light substance; admitting said desulfurized light substance into said low temperature coking reactor to recover desulfurized gas and desulfurized light oil; transferring said coke particles into an alkali metal sulfide regeneration reactor from said high temperature coking reactor; contacting said coke particles in a high regeneration bed operating at a temperature of from 600° to 800°C with high temperature fuel gas transferred from a heating and gasifying reactor thereby converting said alkali metal sulfide compound which has fixed the sulfur in the raw material heavy oil con-

tained in said coke particles into the alkali metal carbonate compound thus releasing the fixed sulfur as hydrogen sulfide; recovering hydrogen sulfide containing fuel gas from said alkali metal sulfide regeneration reactor; transferring said coke particles into a heating and gasifying reactor provided with a gasifying fluidized bed; converting most of the coke in the coke particles into heated fuel gas in said gasifying fluidized bed operating at a temperature of from 700° to 1,000°C; transferring said fuel gas into said alkali metal sulfide regeneration reactor thus recovering said fuel gas as hydrogen sulfide containing fuel gas; and recirculating the alkali metal carbonate containing particles from which most of the coke has been removed through said high temperature coking reactor.

3,907,663

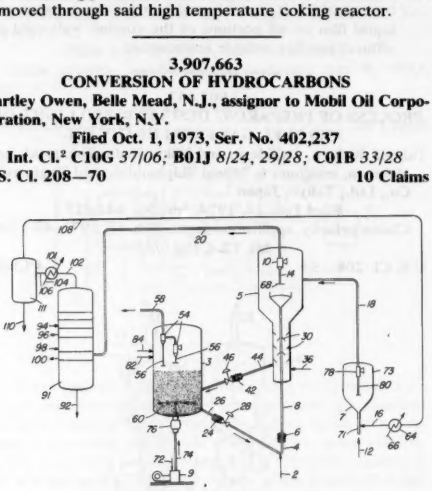
CONVERSION OF HYDROCARBONS

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,237

Int. Cl.[2] C10G *37/06*; **B01J** *8/24, 29/28*; **C01B** *33/28*

U.S. Cl. 208—70 **10 Claims**



1. A method for converting relatively high and low boiling hydrocarbons to gasoline boiling range materials which comprises,

cracking gas oil boiling range hydrocarbons in a cracking zone in the presence of a regenerated dual-component cracking catalyst comprising a ZSM–5 type of crystalline zeolite under elevated temperature cracking conditions selected to form gasoline boiling range components and lower boiling gaseous hydrocarbons comprising olefins and paraffins,

separating the gaseous hydrocarbons from gasoline boiling range components and passing the gaseous hydrocarbons in contact with a separate mass of ZSM–5 type zeolite catalyst having activity for cyclizing and aromatizing said gaseous hydrocarbons to form aromatics, combining the hydrocarbon product of gaseous hydrocarbon aromatizing step with a product of said gas oil cracking before separating the products thereof, passing catalyst used in said gas oil cracking to catalyst regeneration, and cascading ZSM–5 type zeolite catalyst from said mass of catalyst used in said aromatizing step operation to said gas oil cracking as required.

3,907,664

INTEGRATED DELAYED COKING AND THERMAL CRACKING REFINERY PROCESS

Harry Richard Janssen, and Gerald Donald Lamb, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 150,116, June 4, 1971, abandoned. This application May 2, 1973, Ser. No. 356,540

Int. Cl.[2] C10B *55/00*; **C10G** *7/00, 37/06*

U.S. Cl. 208—80 **2 Claims**

1. An integrated refinery process including a delayed coking operation and a thermal cracking operation in which said delayed coking operation and said thermal cracking operation utilize a single fractionator, said process comprising:

a. charging a liquid hydrocarbon feedstock to a fractionator;

b. withdrawing coker feedstock from the lower portion of said fractionator and charging said coker feedstock to a coker furnace heater;

c. passing said coker feedstock from the coker furnace heater to a delayed coking drum;

d. withdrawing overhead product from said delayed coking drum and returning said overhead product to said fractionator;

e. withdrawing thermal cracker feedstock from an intermediate portion of said fractionator and charging said thermal cracker feedstock to a thermal cracking furnace;

f. thermally cracking said thermal cracker feedstock in said thermal cracking furnace and returning the cracked material to said fractionator;

g. operating said fractionator receiving said liquid hydrocarbon feedstock, said overhead product from the delayed coking drum and said cracked material to produce coker feedstock and thermal cracker feedstock; and

h. recovering delayed coke from said delayed coking drum.

3,907,665

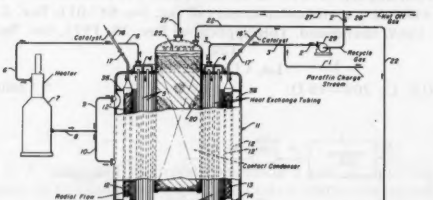
DEHYDROGENATION PROCESS

George R. Winter, III, Des Plaines, and William G. Boney, Arlington Heights, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 301,007, Oct. 26, 1972, abandoned. This application Mar. 14, 1974, Ser. No. 451,660

Int. Cl. C10g *23/00, 35/00*

U.S. Cl. 208—146 **13 Claims**



1. A hydrocarbon conversion process which comprises the steps of:

a. passing a hydrocarbon feed stream at conversion conditions radially through a bed of conversion catalyst in a radial flow reactor;

b. passing the resultant conversion product effluent from the catalyst bed in indirect heat exchange with a cooling fluid within said reactor; and

c. then passing the resultant cooled effluent into a solid contact material disposed within said reactor at conditions effecting partial condensation and separation of the effluent into a vapor phase and a liquid phase, whereby the pressure drop within the process is reduced and the degradation within the reactor of hot conversion products is reduced.

3,907,666

HYDROCARBON SWEETENING WITH A CALCINED PELLET OF COPPER SALT AND FERRIC OXIDE

Sun W. Chun, Murrysville; Harry A. Hamilton, Natrona Heights, and Angelo A. Montagna, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 163,068, July 15, 1971, Pat. No. 3,809,643. This application Feb. 7, 1974, Ser. No. 440,603

Int. Cl. C10g *27/04, 27/08*

U.S. Cl. 208—191 **4 Claims**

1. A process for the oxidative sweetening of a sour hydrocarbon which comprises:

contacting said hydrocarbon under sweetening conditions in the presence of a gas containing free molecular oxygen; with a catalyst prepared by a method which comprises intimately physically admixing a finely divided copper salt with finely divided ferric oxide;

compressing the salts at a pressure sufficient to form a pellet;

and thereafter calcining the pellet at a temperature of 400°–800°F.

3,907,667

PROCESS FOR PRODUCING A LUBRICATING OIL FROM A RESIDUE FEED

Harry C. Murphy, Jr., Apollo; Robert A. Plundo, Greensburg; Harry C. Stauffer, Cheswick; Herman Taylor, Jr., Pittsburgh, and Stephen J. Yanik, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 22, 1973, Ser. No. 390,360

Int. Cl.² C10G *34/00*

U.S. Cl. 208—210 **6 Claims**

1. A process for producing lubricating oil from a feed residual petroleum oil containing asphaltenes, metals and sulfur without a distillation or a solvent extraction step for removal of asphaltenes comprising pretreating said feed oil in a plurality of hydrodesulfurization stages in series including an initial stage and a final stage each operating at a temperature between about 650° and 800°F., each stage employing a catalyst comprising Group VI and Group VII metals on alumina, increasing the temperature in each stage with increasing catalyst age to compensate for catalyst activity aging loss, maintaining a lower hydrogen pressure in said final stage than in said initial stage, removing asphaltenes, metals and sulfur from the feed oil in said initial and final stages with a greater amount of metals and sulfur being removed from the feed oil in said initial stage than in said final stage, operating said final stage at a hydrogen pressure between 1,300 and 1,900 psi and operating said initial stage at a hydrogen pressure up to 2,300 psi which is higher than the pressure in said final stage so that the ratio of percent demetallization to percent desulfurization is higher in the final stage than in the initial stage, the catalyst in said final stage comprising a higher weight percent of Group VI and Group VIII metals than the catalyst in said initial stage so that said final stage of said pretreatment produces a substantially asphaltene-free hydrodesulfurized effluent comprising more than 80 volume percent yield boiling above the gasoline range based on said feed residual oil, and charging at least the highest boiling portion of said effluent to a lubricating oil hydrotreater for conversion to lubricating oil.

3,907,668

HYDRODESULFURIZATION OF PETROLEUM DISTILLATES

Robert D. Christman, and Geoffrey R. Wilson, both of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 272,018, July 14, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,333

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **4 Claims**

1. A process for catalytically hydrode-sulfurizing a sulfur-containing asphaltene-free petroleum distillate which comprises contacting said distillate with hydrogen at hydrodesulfurization conditions and with a catalyst consisting essentially of a hydrogenating component selected from the Group VI-B metals and at least one hydrogenating component selected from the iron group metals composited with an alumina base, at least 65 percent of the pore volume of said composite catalyst being in pores having a radius in the range of 50 to 300 A units, the average pore radius of said composite catalyst being in the range of 45 to 75 A units, the surface area of said composite catalyst being at least 150 square meters per gram, the pore volume of said composite catalyst being at least 0.5 cc per gram said composite catalyst having been prepared by calcining an alumina support having a bayerite content in the range of 0 to 50 weight percent at a temperature in the range of 800° to 1600°F., impregnating said calcined alumina support with said hydrogenating components, and thereafter calcining said impregnated alumina support at a temperature in the range of 800° to 1600°F.

3,907,669

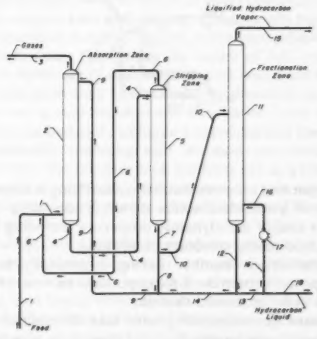
SEPARATION PROCESS WITH REDUCED ENERGY CONSUMPTION

Dennis J. Ward, South Barrington, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 22, 1974, Ser. No. 445,017

Int. Cl. C10g *5/04*

U.S. Cl. 208—341 **3 Claims**



1. A process for the recovery of selected products from a vaporous mixture of normally gaseous and gasoline boiling hydrocarbons and hydrogen which comprises the steps of:

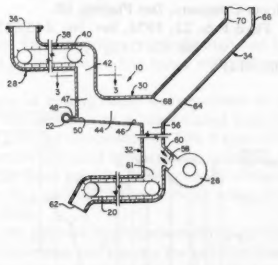
a. countercurrently contacting said mixture with an absorber oil in an absorption zone under conditions to absorb in said oil and separate from the mixture hydrocarbons of more than two carbon atoms per molecule;

b. removing from the upper portion of said zone hydrogen and hydrocarbons of less than three carbon atoms per molecule;

c. removing from the lower portion of said zone a rich absorber oil containing the absorbed hydrocarbons and entrained hydrogen and hydrocarbons of less than three carbon atoms;

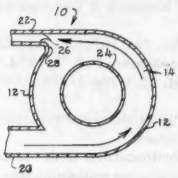
d. stripping said rich absorber oil of hydrogen and hydrocarbons of less then three carbon atoms in a stripping zone, thereby forming a stripped oil principally comprising hydrocarbons of three and more carbon atoms per molecule, including gasoline boiling hydrocarbons;
e. supplying said hydrogen and hydrocarbons of less than three carbon atoms stripped from said rich absorber oil in said stripping zone to the lower portion of said absorption zone;
f. supplying a portion of said stripped oil to said absorption zone as a portion of said absorber oil;
g. fractionating the remainder of said stripped oil in a fractionation zone maintained under conditions to separate the same into a liquefied petroleum gas product and a stabilized gasoline product;
h. supplying a portion of said stabilized gasoline product to said absorption zone as another portion of said absorber oil; and
i. recovering the remainder of said stabilized gasoline product and said liquefied petroleum gas product.

3,907,670
AIR CLASSIFIER FOR MUNICIPAL REFUSE
John Henry Fernandes, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed June 20, 1974, Ser. No. 481,416
Int. Cl.[2] B07B *7/01, 11/06*
U.S. Cl. 209—137 **14 Claims**



1. Apparatus for pneumatically classifying a heterogeneous mixture of particulate solids material according to relative densities and/or aerodynamic properties including a substantially closed casing structure comprising:
a. distribution chamber having a generally horizontally disposed bottom deck for deposition thereon of the material to be processed therein;
b. means communicating with said distribution chamber adjacent one longitudinal end thereof for supplying material to be processed thereto;
c. a generally upstanding elutriation column communicating at its top with the other longitudinal end of said distribution chamber, the bottom of said column being open for the discharge of the more dense material fraction;
d. means for supplying elutriation air to said column at a high velocity sufficient to lift some of said material while allowing the remainder thereof to fall for upward flow therethrough;
e. means for directing higher velocity sweep air against the material contained therein longitudinally of said distribution chamber in the direction of the point of communication of said elutriation column; and
f. an obliquely upwardly extending duct communicating at one end with said distribution chamber adjacent the juncture of said elutriation column and having its other end open for the discharge of the less dense material fraction therefrom.

3,907,671
SEPARATING DEVICE
Joseph F. Baigas, Jr., 4901 Sentinel Post Rd., Charlotte, N.C. 28211
Filed Dec. 18, 1974, Ser. No. 533,869
Int. Cl.[2] B04C *5/14*
U.S. Cl. 209—144 **10 Claims**



1. A device for separating relatively long textile fibers from an air-borne mixture consisting of said fibers and smaller particulate matters such as lint, dust and the like, comprising:
a generally cylindrical housing having first and second end walls at opposite ends thereof, and having a diameter to length ratio within the range of approximately 1 to 1.1 – 2.0;
inlet means including an inlet duct extending substantially tangentially to and opening substantially tangentially through the curved side wall of said housing closely adjacent said first of said end walls thereof for introducing said mixture into said housing for passage in a predetermined rotational direction along a spiraling path of travel extending about the axis of said housing and toward said second of said end walls thereof;
first outlet means communicating with said housing for during operation of said device conducting a major portion of said long textile fibers of said mixture and a minor portion only of said smaller particulate matter and of the entraining air of said mixture from said housing at a velocity approximately equal to said velocity at which said mixture is introduced into said housing through said inlet means; said first outlet means including a first outlet duct member extending substantially tangentially from said housing in said predetermined rotational direction and opening substantially tangentially through said curved side wall of said housing closely adjacent said second of said end walls thereof; the mouth of said first outlet duct having an edge portion extending generally parallel to said axis of said housing; and said edge portion of said duct mouth having a radius of curvature of at least approximately 2 inches;
and second outlet means communicating with said housing for during operation of said device conducting therefrom a minor portion only of said long textile fibers and a major portion of said smaller particulate matter and of the entraining air of said mixture at a velocity equal to approximately one-half of said velocity at which said mixture is introduced into said housing through said inlet means, said second outlet means including a generally cylindrical duct member projecting coaxially of and into said housing through one of said end walls thereof; said cylindrical duct member having an open terminal end disposed within said housing and spaced in the length direction of said housing from both said inlet means and said first outlet means.

3,907,672

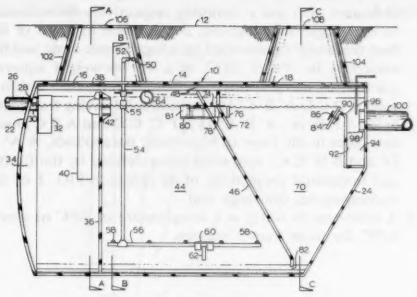
AEROBIC SEWAGE DIGESTION SYSTEM

George A. Milne, 45-342 Lilipuna Rd. No. 304, Kaneohe, Hawaii 96744

Continuation-in-part of Ser. No. 246,253, April 21, 1972. This application Nov. 24, 1972, Ser. No. 309,516

Int. Cl. C02c *1/08*; C02b *3/08*

U.S. Cl. 210—7 10 Claims



1. Self contained closed aerobic sewage treatment apparatus comprising a closed tank having a cylindrical wall oriented around a generally horizontally axis and having first and second end walls joining the cylindrical wall in completion of a closed body, a sewage inflow opening in the first end wall, an effluent outflow opening mounted in the second end wall, a first generally vertical partition extending upward within the tank from a lower portion of the cylindrical wall to a position spaced slightly beneath an upper portion of the cylindrical wall, thereby forming a first chamber between the first partition and the first end wall for pretreatment of the incoming sewage, an opening in the first partition for conducting liquid material out of the first chamber, a second partition extending from a position spaced upward from a lower portion of the cylindrical wall and near the second end wall generally upward to a position spaced from an upper portion of the cylindrical wall, thereby dividing the tank into a second central chamber and a third chamber near the second end wall of the tank, aeration means extending downwards in the central chamber and along a bottom of the central chamber for releasing oxygen bearing material into sewage in the second chamber for aerating the sewage and promoting upward circulation, an opening in the second partition for permitting sewage to flow from the central chamber to the third chamber and means for returning solid materials from the third chamber to the second chamber, whereby solid materials returns to the central chamber and liquid effluent flows through the effluent outflow opening in the second end wall, a first modified "T" connected to the inflow opening in the first end wall and extended downward for directing flow of sewage downward in the first chamber, a second modified "T" having a short horizontal leg portion connected to the opening in the first vertical partition and having an elongated portion extending downward into the first chamber and opening at a remote end, whereby sewage flows upward through the elongated portion and then through the leg portion into the central chamber, wherein the upper ends of the "T"s open to the space at the top of the first chamber above sewage level in the first chamber, an upward opening in the cylindrical wall above the first generally vertical partition and a vertical manway, connected around the upward opening and extending upward therefrom, and a plate covering the manway at its top, thereby providing access to the first chamber and to the central chamber, an opening in an upper portion of the cylindrical wall above the third chamber, and a manway surrounding the opening and extending upward therefrom and a cover on the manway for providing access to the tank in the area of the third chamber, a bottom wall connected to the second end wall below the effluent outflow opening and a third partition connected to the bottom wall, thereby forming a trough adjacent the effluent outflow opening whereby effluent flows into the trough from the third chamber and out of the trough through the effluent opening.

3,907,673

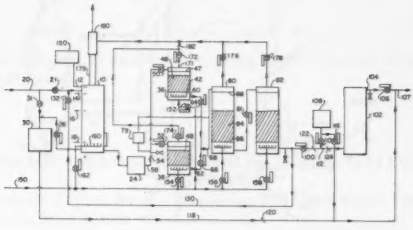
TREATING WASTE

Thomas E. Belk, Bowie, Md.; Stephen S. Blecharczyk, Kingston, and Edward L. Shunney, Warwick, both of R.I., assignors to Fram Corporation, East Providence, R.I.

Continuation-in-part of Ser. No. 876,842, Nov. 14, 1969, abandoned. This application Dec. 28, 1971, Ser. No. 213,104

Int. Cl. C02c *1/04*; C02b *1/14*

U.S. Cl. 210—17 3 Claims



3. A method of treating waste comprising the steps of

accumulating waste in a receiver tank having an outlet,

providing downstream of said receiver tank at least one treatment tank having an inlet connected to said receiver tank outlet and a packed bed of adsorbent particles for mechanical filtration of solid contaminants and adsorption of liquid contaminants contained in said waste, and controlling the flow of waste and air in said system to provide a treatment cycle in which waste flows from said receiver tank through said treatment tank, an aeration and fluidization cycle in which air flows upwardly through said treatment tank to fluidize and biologically regenerate said adsorbent particles therein, and a recirculation cycle in which waste flows from the outlet of said treatment tank to upstream of said receiver tank and down through said treatment tank in the opposite direction as the air flows during said aeration and fluidization cycle to reestablish said bed and discharge loosened solids therefrom, automatically initiating said aeration and fluidization cycle when the receiver tank contents are at a first level, automatically initiating said treatment cycle when said receiver tank contents are at a second level above said first level, and

automatically initiating said recirculation cycle immediately following said aeration and fluidization cycle when said receiver tank contents are at a level intermediate said first and second levels, whereby waste flows into said receiver tank during said aeration and fluidization cycle, whereby during said recirculation cycle loosened solids are discharged from said treatment tank and the bed therein is reestablished.

3,907,674

FLUID BED INCINERATION OF WASTES CONTAINING ALKALI METAL CHLORIDES

Elliott J. Roberts, Westport, and Peter Allen Angevine, Ridgefield, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 24, 1974, Ser. No. 463,655

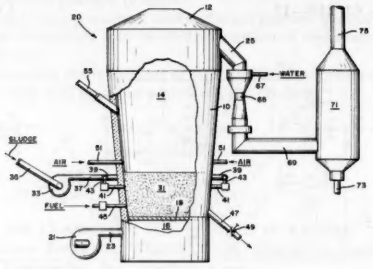
Int. Cl.[2] C02B *1/34*; F23D *19/00*

U.S. Cl. 210—20 13 Claims

1. A process for fluid bed incineration, in the presence of sulfur or sulfur-containing compounds, of an aqueous com-

bustible organic waste stream contaminated with at least one alkali metal chloride, comprising the steps of:

1. fluidizing a body of particulate material in a reaction chamber by passing an upwardly flowing stream of air therethrough,
2. maintaining the fluidized body at a temperature in the range from about 800°C up to about 1,000°C to burn the organic material and volatilize a substantial portion of the alkali metal chloride, the unvolatilized alkali metal remaining in the bed being expressed in terms of water-soluble and water-insoluble Na,
3. introducing finely divided SiO_2 in an effective amount of up to 3%, by weight, based on the water content of said



combustible waste, and at least one metal oxide selected from the group consisting of CaO, MgO, Al_2O_3 and Fe_2O_3 into the reaction chamber for reaction with the remaining portion of alkali metal to form high-melting alkali metal crystalline compounds, said metal oxide being added to provide an amount corresponding to at least 1 mole thereof for every 2 moles of water-insoluble Na present in the bed when said oxide is Al_2O_3 or Fe_2O_3, and to provide at least 2 moles thereof for every 2 moles of water-insoluble Na present in the bed when said oxide is CaO or MgO and

4. discharging the gaseous and solid reaction products from the reaction chamber for disposal or further treatment.

3,907,675

SEMI-PERMEABLE POLYVINYL ALCOHOL MEMBRANES

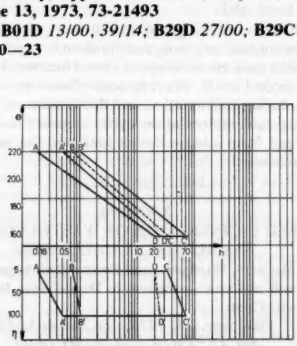
Robert Chapurlat, Ecully; Louis Nicolas, Neuilly, and Richard Dick, Paris, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed July 19, 1973, Ser. No. 380,751

Claims priority, application France, July 20, 1972, 72-26232; June 13, 1973, 73-21493

Int. Cl.[2] B01D *13/00, 39/14;* **B29D** *27/00;* **B29C** *25/00*

U.S. Cl. 210—23 **8 Claims**



1. In a process for the heat treatment of material of thickness from 10 to 50 μ, said material having been formed from a polyvinyl alcohol/solvent mixture, said solvent being capable of dissolving said polyvinyl alcohol, said polyvinyl alcohol having an ester number from 0 to 5, and a viscosity, as a 4% by weight aqueous solution, from 5 to 100 cPo at 20°C., the improvement wherein the material is subjected to, successively,

i. a dry heat treatment at a temperature of from 160°C to 220°C and for a period of about 10 minutes to about 70 hours, carried out under conditions such that the point M (defined, in a system of three rectangular cartesian coordinates, ϕ, h and ν, denoting respectively the temperature in degrees Centigrade, the duration in hours of the heat treatment represented on a logarithmic scale and the visocosity in cPo at 20°C. of a 4% by weight aqueous solution of the polyvinyl alcohol) is contained within a solid A B C D A′ B′ C′ D′, the said solid having four plane faces A B B′ A′, A′ B′ C′ D′, D′ C′ C D and A B C D and two faces in the form of hyperbolic paraboloids, A A′ D D′ and B B′ C C′, said solid being defined by the frontal and horizontal projections of its apices in FIG. 1 of the accompanying drawings, and

ii. a treatment in water at a temperature of 90°C or above 90°C. for more than 5 minutes.

3,907,676

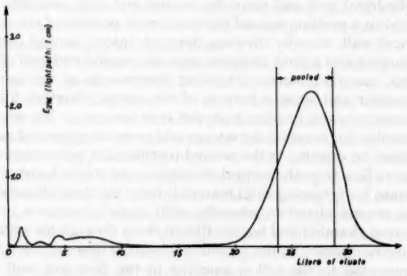
PROCESS FOR PURIFYING INSULIN

Klavs Holger Jorgensen, Virum, Denmark, assignor to Novo Terapeutisk Laboratorium A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. No. 59,015, July 28, 1970, abandoned, which is a division of Ser. No. 845,345, July 28, 1969, abandoned. This application May 14, 1973, Ser. No. 360,340

Int. Cl.[2] B01D *15/08;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 210—31 C **13 Claims**



1. A process for reducing the antigenicity of the insulin that has been recovered from pancreas glands of domestic mammals and which contains insulin-like impurities, which comprises dissolving the insulin in a water-containing medium, adjusting the insulin solution to a pH-value within the range of 6 to 9, applying the insulin solution on a chromatographic column of an anion exchanger to fix the insulin to the column, fractionally eluting the column with an eluent containing water together with a water-miscible monohydric aliphatic alcohol in a concentration of 40 to 80 per cent (v/v), thereby separating the insulin from its impurities, collecting the insulin-containing fractions showing essentially a single component when analysed by discontinuous polyacrylamide gel electrophoresis (DISC PAGE), and recovering the insulin contained in the collected fractions.

3,907,677

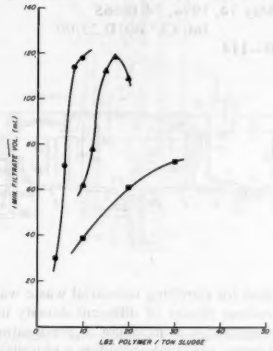
REGULAR ALTERNATING COPOLYMERS OF STYRENE AND IMIDAZOLINES AND THEIR DERIVATIVES

Richard Carl Capozza, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

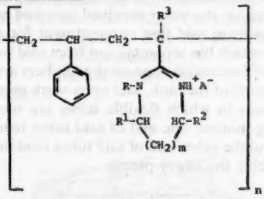
Division of Ser. No. 399,673, Sept. 21, 1973, Pat. No. 3,826,787. This application May 22, 1974, Ser. No. 472,339

Int. Cl. B01d *21/01*

U.S. Cl. 210—54 4 Claims



1. A process for dewatering an aqueous suspension which comprises mixing an aqueous suspension of an organic or inorganic, water-insoluble, particulate material with an effective amount of a polymer salt having completely alternating 1:1 units of the formula



wherein A^- is an anion, m is 0 or 1, R, R^1 and R^2 are, individually, hydrogen, lower alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}) or alkaryl (C_7–C_{11}), R^3 is hydrogen or methyl and n is at least about 50 and separating the particulate material from the suspension.

3,907,678

SPLIT AIR STREAM BEFORE AND AFTER THE HEAT EXCHANGER IN A WET OXIDATION PROCESS

Louis A. Pradt, Wausau, and Wayne B. Gitchel, Rothschild, both of Wis., assignors to Sterling-Winthrop Research Institute, Rensselaer, N.Y.

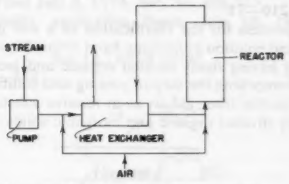
Continuation-in-part of Ser. No. 323,205, Jan. 12, 1973, abandoned. This application Apr. 11, 1974, Ser. No. 460,093

Claims priority, application United Kingdom, Jan. 8, 1974, 00844/74

Int. Cl.² C02C *5/04*

U.S. Cl. 210—63 1 Claim

1. In a wet air oxidation system comprising a heat exchanger and oxidation reactor, a method for treating a fluid stream containing organic substances characterized by a tendency to polymerize when heated in the absence of oxygen, which comprises determining the minimum amount of oxygen necessary to oxidize the polymerizable substances to non-polymerizable form, adding to said fluid stream prior to entering the heat exchanger air containing said minimum amount of oxygen, and adding to said fluid stream after leaving the heat exchanger and prior to or upon entering the reactor additional



air sufficient to meet the remaining oxygen demand of said fluid stream.

3,907,679

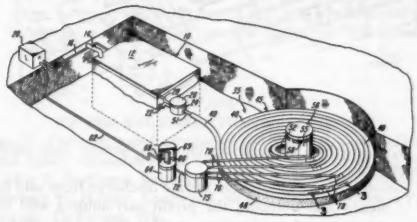
SEWAGE TREATMENT SYSTEM INCLUDING EFFLUENT EVAPORATOR

Kenneth J. Yost, Eaton, Ohio, assignor to Coate Burial Vault, Inc., West Milton, Ohio

Filed Mar. 26, 1973, Ser. No. 345,113

Int. Cl.² B01D *1/04*

U.S. Cl. 210—70 9 Claims



1. In a sewage treatment system including a tank buried within the ground and having an inlet for receiving sewage water and an outlet for discharging a substantially clear water effluent, an improved device for evaporating the effluent into the atmosphere, comprising an elongated flexible tubular conduit system of plastics material, said conduit system arranged to form a substantially flat horizontal coil buried within the ground, said conduit system having an inlet end portion connected to said outlet of said tank for receiving the effluent within the lower portion of the conduit system and for exposing a substantial surface area of the effluent along the length of said conduit system, said conduit system having an outlet end portion, means for venting said outlet end portion to the atmosphere above the ground, air supply tube means connected to said conduit system at a plurality of longitudinally spaced intervals along said conduit system, means for supplying air flow within said air supply tube means to produce a corresponding plurality of air streams into said conduit system, and said air streams being effective to produce a longitudinal flow of air in a common direction within the upper portion of said conduit system for vaporizing the effluent within said conduit system into the flow of air within said conduit system for discharge as a vapor into the atmosphere through said outlet end portion of said conduit system.

3,907,680

CLARIFICATION OF AQUEOUS ACIDIC PHOSPHATIC SOLUTIONS

Richard N. Hill, Sr., 3412 Polk Ave., Lakeland, Fla. 33803

Filed Nov. 6, 1973, Ser. No. 413,259
Int. Cl.[2] B01D *38/18*; C02B *1/02*
U.S. Cl. 210—71 5 Claims

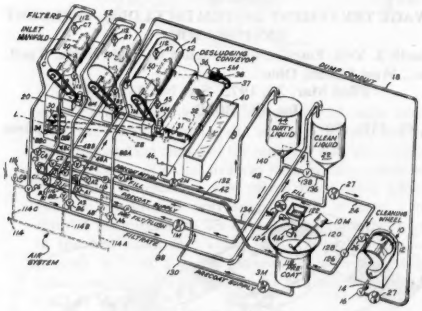
1. A process for the clarification of a wet process phosphoric acid solution containing from about 25 to about 35 % P_2O_5 and having finely divided organic and inorganic solids therein comprising the step of passing said solution through a layer of perlite filter aid so as to remove substantially all of said finely divided organic and inorganic solids.

3,907,681

FILTER SYSTEM AND METHOD

John E. Corrigan, Evanston; Henry J. Dokter, Lansing, and Ambrose Ethington, Country Club Hills, all of Ill., assignors to F. W. Means & Company, Chicago, Ill.

Filed Nov. 12, 1973, Ser. No. 414,735
Int. Cl.[2] B01D *37/02*, *23/24*
U.S. Cl. 210—75 29 Claims



1. A method of regenerating filter means, said method comprising:

simultaneously closing the filtrate discharge from said filter means and dumping the prefilt surrounding said filter means to reduce the pressure of prefilt surrounding said filter means,

directing a flushing fluid against the prefilt side of said filter means while dumping said prefilt, and

introducing a fluid at the filtrate side of said filter means to slightly, but rapidly, increase the pressure on the filtrate side of said filter means upon commencement of directing said flushing fluid against said prefilt side of said filter means.

10. A fluid filter regeneration system including a fluid enclosure having filter means therein and prefilt inlet means and filtrate discharge means communicating with prefilt and filtrate sides of said filter means, flushing means for directing a flushing liquid against the prefilt side of said filter means, and dump means for discharging the fluid from the prefilt side of said filter means, wherein the improvement comprises in combination therewith;

valve means on said filtrate discharge means, said dump means and said flushing means,

means for introducing a fluid at the filtrate side of said filter means, and

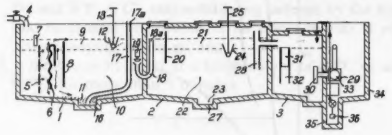
control means controlling said valve means and said means for introducing a fluid such that said filtrate discharge means are closed and said dump means and flushing means are opened simultaneously to reduce the pressure of prefilt on the prefilt side of said filter means and actuating said means for introducing a fluid substantially simultaneously with said closing of said filtrate discharge means for slightly, but rapidly, increasing the pressure on the filtrate side of said filter means to rapidly equalize the pressure across said filter means.

3,907,682

PURIFICATION OF INDUSTRIAL WASTE WATER

Robert Auguste Basseet, St.-Germain-en-Laye, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed July 11, 1974, Ser. No. 487,389
Claims priority, application France, July 27, 1973, 73.27690; May 14, 1974, 74.16665
Int. Cl.[2] B01D *23/00*
U.S. Cl. 210—114 11 Claims



1. Apparatus for purifying industrial waste water for separating the various phases of different density in such waste water, said apparatus comprising a pre-treatment tank to receive said water, said tank including a plurality of compartments, a first one of said compartments having an anti-turbulence partition and a thermal partition spaced from said anti-turbulence partition, a heating device having a large heat-exchange area disposed in said first compartment, said heating device being operative to set up, in a predetermined volume between said anti-turbulence and said thermal partitions, convection currents which facilitate the separation of the phases making up the water received into said tank, and suction pipe means in said first compartment for removing the heavy phase which has separated out from said water comprising a series of horizontal open-work members arranged parallel to the bottom of the tank, said open-work member forming guide members in which flexible tubes are movable with a reciprocating motion, one end of said tubes being connected to suction and the other end of said tubes containing an opening for inducing the heavy phase.

3,907,683

MULTITUBULAR CONSTANT HEAD REFLUX CONDENSER

Roger Gilmont, Douglaston, N.Y., assignor to Gilmont Instruments, Inc., Great Neck, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,951
Int. Cl.[2] E01D *3/14*
U.S. Cl. 202—177 10 Claims

1. In distillation apparatus comprising an evaporator for vaporizing feed liquid and a condenser for condensing distillation vapor from said evaporator and preheating the feed liquid for said evaporator, the improvement wherein said apparatus comprises:

A. a vapor conduit in fluid communication with said evaporator for passage of distillation vapor therethrough;

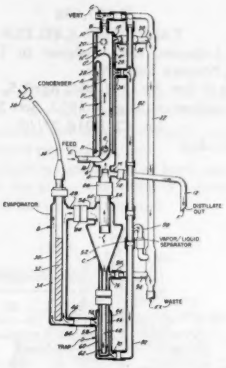
B. a liquid conduit in advance of and in fluid communication with said evaporator and in heat-transfer relationship with said vapor conduit for passage of feed liquid therethrough to partially preheat said feed liquid and condense said distillation vapor; and

C. a valved liquid conduit for further preheating a portion of said partially preheated feed liquid having

i. an inlet communicating with said liquid conduit intermediate the ends thereof to receive said portion of partially preheated feed liquid,

ii. an outlet communicating with said evaporator to for-

ward said portion of further preheated feed liquid thereto, and



iii. an adjustable valve means intermediate said inlet and outlet for regulating the flow of said portion of feed liquid therethrough.

3,907,684

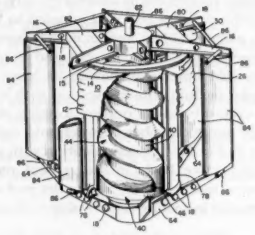
ROTARY OIL RECOVERY DEVICE WITH NON-INTEGRAL COLLECTING HEAD

Frank Galicia, 5043 Catherine St., Philadelphia, Pa. 19143

Filed Apr. 18, 1973, Ser. No. 352,208The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.

Int. Cl. E02b *15/04*

U.S. Cl. 210—242 9 Claims



1. A device for separating two liquids of different densities forming a liquid interface, including:

a rotatable cylindrical member disposed within said device, an inverted trough supported by and disposed in a spiral fashion around the perimeter of said cylindrical member, a separation chamber disposed within said rotatable cylindrical member, said separation chamber communicating with the base of said inverted trough to receive the less dense liquid, and

rotatable liquid collection means spanning said liquid interface to direct said liquids into said trough, said liquid collection means rotatable at a variable speed relative to the speed of rotation of said rotatable cylindrical member.

3,907,685

BELT DEVICE FOR COLLECTING FLOATING MATTER FROM WATER SURFACE

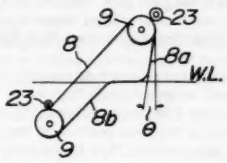
Kuninori Aramaki, Yokohama; Hiroshi Kawakami, Kamakura, and Masao Suzuki, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed July 8, 1974, Ser. No. 486,723

Claims priority, application Japan, July 10, 1973, 48-81597[U]

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 9 Claims



1. Apparatus for collecting materials from the surface of a body of water, said apparatus comprising:

a floating vessel supporting an endless belt constructed and arranged on said vessel so that an upper roller of said endless belt is above the surface of said body of water and the lower roller of said belt is beneath the surface of said body of water, said endless belt having an upper run and a lower run,

drive means for said endless belt comprising drive rollers pressing the surface of said belt against the upper and lower rollers to retain said endless belt on its lower roller and to drive the upper run of said belt over the upper roller, whereby the lower run of said belt is substantially longer than the distance between said upper and lower rollers.

3,907,686

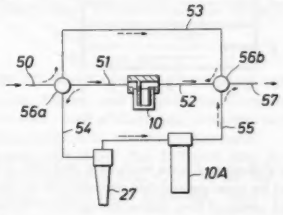
FILTER REGENERATION SYSTEMS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Victor A. DesCamp, Lakewood; Michael W. Boex, Littleton; Michael W. Hussey, Lakewood, all of Colo., and Thomas P. Larson, La Crosse, Wis.

Filed Aug. 3, 1973, Ser. No. 385,522

Int. Cl.² B01D *41/04*

U.S. Cl. 210—259 6 Claims



1. A fluid filter regeneration system comprising

a fluid system having an input line and an output line and bidirectional input valve means and bidirectional output valve means, connected respectively to said input line and said output lines,

first, second, and third flow lines extending between said input valve means and said valve means,

a regenerative fluid filter in the first flow line,

a separator means for separating particulate matter from a flow of fluid by a vorticular motion in the second flow line,

the third flow line connected between said input valve means and said output valve means,

said input valve means being operable in a first position for connecting said first flow line to the system input line and in a second position for connecting said third flow line to the system input line, and connecting said first flow line to the second flow line,

said output valve means being operable in a first position for connecting said first flow line to a system output line and in a second position for connecting said third flow line to the first flow line thereby directing flow in reverse direction through the first flow line for reversing fluid flow through the regenerative filter means in said first flow line and for connecting said second flow line to the system output line,

said input valve means and said output valve means constructed and arranged such that when the input valve means is in the first or second position, the output valve means is also in the same position so that when the valves are in the first position, flow is directed from the system input line through the first flow line to the system output line and when the valves are in the second position, flow is from the system input line through the third flow line then in a reverse direction through the first flow line, then through the second line and then the system output line.

3,907,687

PLATE DIALYZER

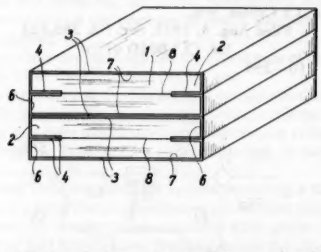
Josef Hoeltzenbein, Muenster, Germany, assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 161,818, July 12, 1971, Pat. No. 3,730,350, which is a continuation of Ser. No. 880,324, Nov. 26, 1969, abandoned. This application Feb. 8, 1973, Ser. No. 330,793

Claims priority, application Germany, July 26, 1969, 1938008; Dec. 7, 1968, 6810380; Dec. 27, 1968, 6813222; Jan. 27, 1969, 6902959

Int. Cl.[2] B01D *33/00*

U.S. Cl. 210—321 **23 Claims**



1. In a diffusion device such as a dialyzer, a stack of plates separated by semi-permeable membranes to provide a pair of separated, isolated flow paths through said diffusion device on opposite sides of said membranes, said plate having a membrane-supporting, profiled surface comprising a plurality of rows of upstanding projections, in which said membranes are disposed across said plates over said projections while stretched in one direction, the spacing of the centers of the projections in rows in the general direction of stretching being greater than the center-to-center spacing of said projections in rows transverse to the general direction of stretching, to prevent undue sagging of said membrane upon wetting in said transverse direction, while permitting low flow resistance across said plates, said surface also comprising a plurality of support ridges extending in continuous, uninterrupted fashion across said plate in the general direction of said flow paths, to abut corresponding support ridges on an adjacent plate of the stack, to control the spacing between facing plates.

3,907,688

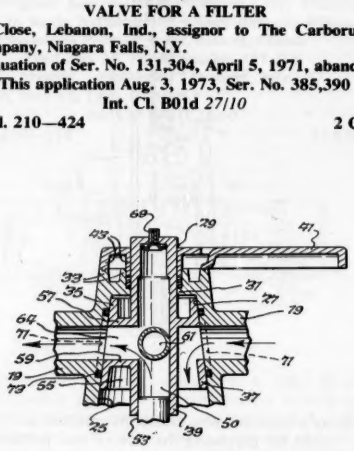
VALVE FOR A FILTER

Sam Close, Lebanon, Ind., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 131,304, April 5, 1971, abandoned. This application Aug. 3, 1973, Ser. No. 385,390

Int. Cl. B01d *27/10*

U.S. Cl. 210—424 **2 Claims**



1. A valve for use with a filter, said valve comprising a valve body having a generally frustoconical opening formed therein and converging toward the top thereof, a pair of conduits opening into said valve body and in fluid communication with said opening and defining an inlet port and an outlet port in said valve body, a gate having a generally frusto-conical outer wall converging toward the top thereof and being disposed in said opening and interfitting with said valve body for rotation therein, said gate including a generally tubular inner wall disposed centrally of said gate and coaxial with the axis about which said gate rotates within said valve body, an inlet channel alignable with said inlet port and adapted to be in fluid communication with said filter, and an outlet channel in said inner wall intermediate the ends thereof and alignable with said outlet port, said inner wall having its lower end open and adapted to be in fluid communication with said filter and its upper end closed by a top portion forming in said inner wall an elongated surge chamber between said outlet channel and top portion and in fluid communication with said outlet channel, and said valve body including seal receiving grooves formed around said inlet port and outlet port and having seals therein disposed in sealing relationship with said outer wall of said gate.

3,907,689

TEXTILE TREATING COMPOSITION AND TEXTILE YARN TREATED THEREWITH

Bobby C. Carver, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,726

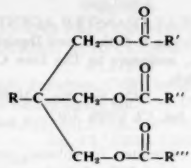
Int. Cl.[2] D06M *13/32, 13/00;* **C10M** *3/14*

U.S. Cl. 252—8.7 **25 Claims**

1. A textile treating composition which comprises:

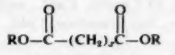
a. a blend containing

1. a major amount of an alkylidyne trimethanol ester having the formula

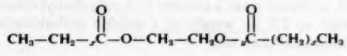


wherein R is H or an alkyl radical having 1 to 12 carbon atoms and R′, R″, and R‴ are selected from the class consisting of saturated alkyl radicals and alkenyl radicals containing from 4 to 14 carbon atoms per radical; and

2. a minor effective amount of at least one member selected from the group consisting of a diester of a dicarboxylic acid having the structure

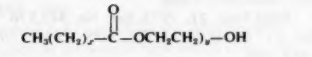


wherein x is 2 to 22 and R is an alkyl radical containing 2 to 22 carbon atoms and an ethoxylated ester of the formula



wherein *x* is 4 to 22 and *y* is 1 to 40; (1) being present in an amount of about 10 to 40 weight percent of said composition and (2) being present in an amount of about 1 to 15 weight percent of said composition;

b. about 10 to 30 weight percent of an ethoxylated fatty acid wax which has a melting point greater than 100°F. and having the formula



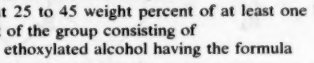
wherein *x* is 10 to 22 and *y* is 5 to 200;

c. about 10 to 20 weight percent of at least one processing aid selected from the group consisting of

1. an alkali metal salt of a phosphoric acid mono- or diester of an ethylene oxide adduct of at least one member selected from the group consisting of a C_8 to C_{18} linear alkyl alcohol which contains 2 to 25 moles of ethylene oxide; and
2. an alkali metal salt of sulfated fatty alcohols containing 12 to 22 carbon atoms; and

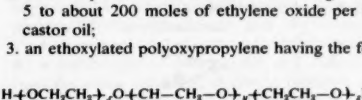
d. about 25 to 45 weight percent of at least one blending agent of the group consisting of

1. an ethoxylated alcohol having the formula



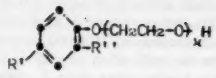
wherein *x* is from 8 to 22 and *n* is 1 to 20;

2. an ethoxylated castor oil ether containing from about 5 to about 200 moles of ethylene oxide per mole of castor oil;
3. an ethoxylated polyoxypropylene having the formula



wherein *x* is 1 to 15, *y* is 1 to 50, and *z* is 1 to 15;

4. an ethoxylated aromatic phenol ether having the formula



wherein R′ and R″ are aryl, alkyl aryl, and *x* is 1 to 25; and

5. an aliphatic saturated or unsaturated unsubstituted alcohol containing 10 to 30 carbon atoms.

3,907,690

LUBRICANT COMPOSITION

James A. Whitt, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 292,550, Sept. 27, 1972, abandoned, and a continuation-in-part of Ser. No. 292,664, Sept. 27, 1972, abandoned. This application Oct. 18, 1973, Ser. No. 407,636

Int. Cl. C10m *5/20, 5/02, 7/30*

U.S. Cl. 252—14 **34 Claims**

1. A lubricant composition for lubricating a component which may be communicated therewith comprising a mixture of a major amount by weight of a liquid lubricant, a minor amount by weight of a particulate mass of synthetic fibers, and a minor amount by weight of a particulate mass of discrete, non-fibrous, multi-digited, resilient-type foam particles generally constituting means for both retaining and releasing the liquid lubricant adapted to effect the lubrication of the component.

3,907,691

EXTREME-PRESSURE MIXED METAL BORATE LUBRICANT

John M. King, San Rafael, and Nicolaas Bakker, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed July 15, 1974, Ser. No. 488,357

Int. Cl.² C10M *3/18, 5/14, 7/20, 7/24*

U.S. Cl. 252—18 **18 Claims**

1. A lubricating composition comprising a major portion of an oil of lubricating viscosity and from 0.1 to 60 weight percent of a particulate mixed alkali and alkaline earth metal borate prepared by reacting within an inert, stable, oleophilic, reaction medium: (1) boric acid, with (2) an alkaline earth metal carbonate overbased alkali or alkaline earth metal sulfonate dispersant, wherein the molar ratio of boric acid to alkaline earth metal carbonate is from about 2 to about 6, to form an intermediate reaction product which is then reacted with an alkali metal base to form said mixed alkali and alkaline earth metal borate, wherein the molar ratio of alkali metal base to said intermediate is from about 1 to about 3.

3,907,692

COMPLEX SOAP LUBRICATING GREASE

Dietrich Ullmann, Moers, and Hans-Dieter Grasshoff, Hamburg-Kirchwerder, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Continuation-in-part of Ser. No. 251,665, May 9, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,203

Claims priority, application Germany, May 10, 1971, 2122978

Int. Cl.² C10M *3/18, 5/14, 7/20, 7/24*

U.S. Cl. 252—18 **4 Claims**

1. A lubricating grease composition effective as an antifriction grease at temperatures up to 220°C, consisting essentially of a major amount of a lubricating oil; of from about 20 to 35 percent by weight, based on the total composition, of a complex of calcium soap of a normal fatty acid, or of a soap former having more than 3 carbon atoms in the molecule, and of a calcium salt of a fatty acid having from 1 to 3 carbon atoms wherein the ratio of the weight of said normal fatty acid or salt former to said fatty acid having less than 3 carbon atoms ranges from about 2 to 1 to about 3 to 1; and 0.1 to 4 percent

by weight of a salt mixture of alkali phosphates and alkali borates, Ca $(OH)_2$ being present in said lubricating grease in an amount which exceeds by 10 to 60 percent by weight that necessary for the saponification of said normal fatty acid, or said soap former having more than 3 carbon atoms in the molecule.

3,907,693

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Yasuo Tamai; Hajime Miyatuka, and Satoru Honjo, all of Tokyo, Japan, assignors to Rank Xerox, Ltd., London, England

Filed May 21, 1973, Ser. No. 362,598
Int. Cl.[2] G03G *9/00*
U.S. Cl. 252—62.1 4 Claims

1. A liquid electrophotographic developer composition consisting essentially of an insulating liquid carrier, a pigment, and a resin mixture, said resin comprising epoxy-ester in a range of from 5 to 70% by weight of the resin and the remainder of the resin mixture is selected from the group consisting of alkyd, resin-modified alkyd, phenol-modified alkyd, styrene-modified alkyd, rosin-modified formaldehyde and polyamide resins.

3,907,694

NON-VOLATILE CONDUCTIVE INKS

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1973, Ser. No. 364,216
Int. Cl.[2] G03G *9/12*
U.S. Cl. 252—62.1 9 Claims

1. a non-volatile, non-hygroscopic, conductive ink consisting essentially of triethylene glycol monobutyl ether, about 5 percent to 25 percent coloring agent dispersible in said triethylene glycol monobutyl ether, about 1 percent to 10 percent of alkylated polymer of heterocyclic N-vinyl monomer dispersing agent for said coloring agent and about 5 percent to 30 percent binder soluble in said triethylene glycol monobutyl ether, said binder being selected from the group consisting of epoxy resins, phenolic resins, polyesters, rosin esters, acrylic type resins and polyamide resins.

3,907,695

LIQUID DEVELOPER

Alan B. Amidon; Joseph Mammino, and Robert M. Ferguson, all of Penfield, N.Y.

Continuation-in-part of Ser. No. 839,801, July 1, 1969, abandoned. This application Dec. 18, 1970, Ser. No. 99,646
Int. Cl.[2] G03G *9/04*
U.S. Cl. 252—62.1 10 Claims

1. A chemically stable, nonaqueous, ambipolar, absorptive drying electrostatographic liquid developer of low volatility having a resistivity of from about 10^8 to 10^{15} ohm-cm comprising from about 30 weight percent to about 85 weight percent of an oleaginous liquid vehical having a bulk resistivity of from about 10^8 ohm-cm to about 10^{15} ohm-cm, from about 5 weight percent to about 60 weight percent of a particulate colorant which is insoluble in at least one liquid present in the liquid developer; from about 1 weight percent to about 35 weight percent of a dispersant of alkylated polyvinyl pyrrolidones where the alkyl substituent has a chain length of from 10 to 20 carbon atoms which is soluble in the oleaginous vehicle and which is capable of substantially suppressing background deposits, and from about 5 weight percent to about 45 weight percent of a fixing agent comprising the ester of an acid selected from the group consisting of mono and polybasic carboxylic acids wherein said acids have from six to 20 carbon atoms and an alcohol selected from the group consisting of saturated and unsaturated mono and polyhydric aliphatic alcohols having from two to 20 carbon atoms.

3,907,696

NEW HEAT TRANSFER AGENTS

Larry L. Jackson; Walter F. Seifert, and Daniel E. Collins, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 3, 1971, Ser. No. 139,882
Int. Cl. C09k *3/02*
U.S. Cl. 252—73 2 Claims

1. A composition of matter, by volume, consisting essentially of about 30 to about 70% of di(phenoxyphenyl) ether, the remainder being essentially diphenyl oxide and biphenyl present in essentially the proportions of their eutectic mixture.

3,907,697

EROSION-INHIBITED FUNCTIONAL FLUIDS

Merwyn L. Burrous, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 21, 1973, Ser. No. 362,144
Int. Cl.[2] C09K *50/00*
U.S. Cl. 252—75 20 Claims

1. A functional fluid composition comprising a fluid base consisting of an ester or amide of a phosphorus acid, hydrocarbon oil, a silicate ester a silicone or a polyphenyl ether, and from 0.0001 to 2% by weight of a soluble perhalometallate or perhalometalloidate salt.

3,907,698

BRIDGED HALOTRIAZINE COMPOUNDS AS BLEACH ACTIVATORS

Frank Fred Loffelman, Somerville, and Thomas Eugene Brady, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 21, 1973, Ser. No. 343,576
Int. Cl.[2] C11D *3/26, 7/32, 7/38;* C01B *15/00*
U.S. Cl. 252—99 6 Claims

1. An activated bleaching composition comprising hydrogen peroxide or a hydrogen peroxide-releasing compound and an activating amount of a bridged halo triazine compound represented by the formula:

where A represents a group selected from vinylene, phenylene, biphenylene, stilbyl and ethynylenebis(p-phenylene) groups; Z represents a group selected from —O—, —S— or —N(H)—; *n* is an integer selected from zero and one; X_1 and X_2 individually represent chlorine, bromine or fluorine; and R_1 and R_2 individually represent halogen, hydroxy, mercapto, alkyl, alkenyl, alkoxy, alkylmercapto, aryl, aryloxy, arylmercapto, dialkoxyphosphinyl or

where R_3 and R_4 may be hydrogen, cyanoalkyl, carboxyalkyl, chloroalkyl, alkoxyalkyl, sulfoalkyl, aryl, sulfoaryl, acylaminoaryl or carbamoylalkyl, or where R_3 and R_4 taken together may be joined to complete a heterocyclic ring selected from morpholine, piperazine and piperidine rings.

3,907,699

COMPOSITION AND PROCESS FOR THE REMOVAL OF COPPER DURING ACID CLEANING OF FERROUS ALLOYS

Charles M. Blair, Fullerton, Calif., assignor to Magna Corporation, Santa Fe Springs, Calif.

Filed Feb. 26, 1973, Ser. No. 335,690

Int. Cl.[2] C02B *5/06*

U.S. Cl. 252—149 **22 Claims**

1. An additive for use in compositions for the removal of copper encrustations encountered during acid cleaning operations of ferrous alloy surfaces consisting essentially of the reaction product of

a. an aliphatic or cycloaliphatic aldehyde having five carbon atoms or less;

b. an amine having an hydroxyethyl or substituted hydroxyethyl group attached to an amino nitrogen atoms; and

c. Thiourea,

the ratio of carbon atoms in the aliphatic or cycloaliphatic substituents to the number of polar groups therein being no greater than about 5-to-1, the molar equivalent of aldehyde being between about 1.0 and about 2.5 per mole of thiourea, the molar equivalent of hydroxy present in the amine being from about 1.0 to about 2.5 times the number of moles of thiourea, and the molar equivalent of hydroxy being equal to the molar equivalent of aldehyde.

3,907,700

CONTROL OF UV DETERIORATION BY INCORPORATION OF N-(BENZIMIDAZOL-2-YL) ARYLCARBOXAMIDES INTO A UV SENSITIVE SUBSTANCE

Nathaniel Grier, Englewood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

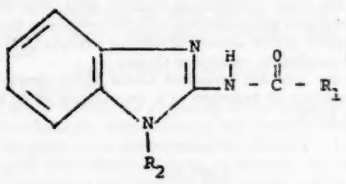
Continuation-in-part of Ser. No. 758,601, Sept. 9, 1968, abandoned. This application Jan. 2, 1973, Ser. No. 320,231

Int. Cl.[2] F21V *9/06*

U.S. Cl. 252—300 **6 Claims**

1. A method for controlling the deteriation of a UV sensitive substance by ultraviolet light which comprises contacting the UV sensitive substance to be protected with an ultraviolet absorbing effective amount of a N-(benzimidazol-2-yl)arylcarboxamide selected from the group consisting of

a. N-(benzimidazol-2-yl)arylcarboxamides having the formula:



(I) and

b. a N-(benzimidazole-2-yl)arylcarboximide derived from a benzene polycarboxylic acid selected from the group consisting of N-(benzimidazol-2-yl)phthalimide, N,N-bis(benzimidazol-2-yl)isophthalamide, N,N-bis(benzimidazol-2-yl)terphthalamide and N-(benzimidazol-2-yl)-4-(benzimidazol-2-yl-carbonyl)-phthalamide wherein R_1 is carbocyclic or heterocyclic aryl radical selected from the group consisting of phenyl biphenyl, naphthyl, anthryl, phenanthryl, furyl, thienyl, pyridyl, pyridazyl, pyrimidyl, pyrazinyl, quinolyl, isoquinolyl, acrydyl, phenanthridyl, phenazyl, phenoxazyl, phenthiazyl, coumaronyl, benzothienyl, indolyl, pyrazolyl, imidazolyl, thiazolyl, oxazolyl, triazolyl, and carbazolyl, attached to the carbonyl group directly or through a (—Ch=CH—) group; R_2 is a member selected from the group consisting of hydrogen, alkanoyl, alkenyl, benzoyl, halobenzoyl, alkoxybenzoyl, alkoxycarbonyl, alkyl and phenyl; and

wherein the ring of said benzimidazole, benzine polycarboxylic acid and the carbocyclic or heterocyclic aryl radical present at R_1 may be unsubstituted or substituted by one or more members selected from the group consisting of alkyl, alkenyl, phenyl, chloro, nitro, hydroxy, alkoxy, phenoxy, naphthoxy, amino, alkylamino, dialkylamino, phenylamino, phenalkylamino, sulfo, carboxy, alkoxycarbonyl, alkylcarbonyl and phenylcarbonyl.

3,907,701

DEMULSIFYING CRUDE OIL EMULSIONS

Gert Liebold, Mannheim; Knut Oppenlaender, Ludwigshafen; Egon Buettner, Ludwigshafen; Rolf Fikentscher, Ludwigshafen, and Rudolf Mohr, Lampertheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 5, 1973, Ser. No. 367,147

Claims priority, application Germany, June 7, 1972, 2227546

Int. Cl.[2] B01D *17/04*

U.S. Cl. 252—344 **7 Claims**

1. In a process for rapid dehydration of a crude oil in the form of a saltwater-in-oil emulsion by the addition of a demulsifying compound based on derivatives of polyalkylene oxides, the improvement which comprises; adding to said crude oil a minor amount of a solution containing in an aqueous or organic phase, as the essential demulsifying compound, a polyalkylene polyamine having at least 50 and up to 3,000 recurring ethylene imine or propylene imine units, which polyalkylene polyamine is totally alkoxylated at the nitrogen atoms with from 10 to 300 moles of ethylene oxide and/or propylene oxide; and then separating the salt-containing aqueous phase from the crude oil.

3,907,702

PROCESS FOR MAKING A FREE FLOWING SOAP-NONIONIC DETERGENT

John H. Mostow, Metuchen, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 377,678, July 9, 1973, Pat. No. 3,814,692, which is a continuation of Ser. No. 167,452, July 29, 1971, abandoned. This application Mar. 14, 1974, Ser. No. 451,023

Int. Cl.[2] C11D *10/04, 11/04, 13/10, 17/06*

U.S. Cl. 252—370 **3 Claims**

1. The method of forming free flowing detergent particles comprising the steps of:

a. intimately mixing a saturated fatty acid having from 12 to 18 carbon atoms with a liquid nonionic surfactant chosen from the group consisting of ethoxylated fatty alcohols having an alkyl chain of from eight to 20 carbon atoms and from about four to about 19 ethylene oxide units per molecule, to produce a liquefied mass,

b. a moisture scavenger being present in said liquefied mass when potassium is said alkali metal to prevent said potassium carbonate from becoming deliquescent,

c. neutralizing said liquefied mass by adding an alkali metal carbonate in sufficient quantity to saponify said fatty acid,

d. said neutralizing step being performed at a predetermined elevated temperature suitable for saponifying said fatty acid,

e. mixing said liquefied mass during neutralization to insure uniform saponification of said fatty acid,

f. cooling the neutralized mass to room temperature,

g. said neutralized mass puffing to a porous solid during said cooling step and,

h. said neutralized mass including from about 10 to about 50 percent by weight of the nonionic surfactant and at least 50 percent by weight of the alkali metal soap of said fatty acid,

i. mechanically reducing said porous solid to particles having a density of from 0.25 to 0.75 grams per cc.

3,907,703

PROCESS FOR PRODUCING REDUCING GAS

Charles P. Marion, Mamaroneck, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 211,443, Dec. 23, 1971, Pat. No. 3,767,379. This application Mar. 28, 1973, Ser. No. 345,798
Int. Cl.[2] C01B 2/14
U.S. Cl. 252—373 5 Claims

1. In a process for the production of a reducing gas mixture comprising principally carbon monoxide and hydrogen by the partial oxidation of a hydrocarbon fuel with a free-oxygen containing gas selected from the group consisting of air, oxygen-enriched air, i.e., greater than 21 mole % oxygen, and substantially pure oxygen, i.e. greater than 95 mole % oxygen and optionally in the presence of a temperature moderating gas selected from the group consisting of H_2O, CO_2, N_2, a cooled portion of reducing gas, and mixtures thereof, in a free-flow reaction zone of a reducing gas generator at an autogenous temperature within the range of about 1,500° to 3,500°F and a pressure in the range of about 1 to 350 atmospheres with the incidental production of minor amounts of particulate carbon, the improvement comprising:

1. mixing in a separate mixing zone all of the effluent reducing gas leaving said free-flow reaction zone with an upgraded reducing gas mixture from step (3) which was previously cooled to a temperature in the range of about 100° to 700°F to produce a product gas stream consisting of an improved reducing gas mixture containing reduced amounts of water vapor and particulate carbon and having a lower temperature than said effluent gas from said reaction zone;
2. introducing a portion of said improved reducing gas mixture into a gas-cooling and scrubbing zone for removal of entrained particulate carbon located downstream from said mixing zone; and
3. withdrawing cooled and cleaned reducing gas mixture from said gas-cooling and scrubbing zone in (2), compressing same to above the pressure of said effluent reducing gas from said reducing gas generator, and introducing said compressed reducing gas mixture into the mixing zone in (1) as said upgraded reducing gas mixture, wherein the ratio of moles of upgraded reducing gas stream per mole of effluent reducing gas streeam from said free-flow reaction zone is in the range of about 0.2 to 0.6.

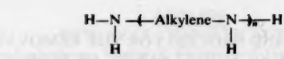
3,907,704

NITROGEN-CONTAINING COMPOSITIONS USEFUL AS RUST INHIBITORS IN FUELS AND LUBRICANTS

John P. Murphy, Willoughby, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 211,795, Dec. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 773,298, Nov. 4, 1968, abandoned. This application Apr. 25, 1973, Ser. No. 354,274
Int. Cl. C10m 1/32
U.S. Cl. 252—392 17 Claims

1. A nitrogen-containing composition for inhibiting rust in lubricants and fuels prepared by reacting at a temperature of at least about 25°C. approximately 0.5 and less than 3.0 equivalents of at least one alkylene amine of the formula



wherein *n* ranges from 2 to about 10 and the alkylene radical has less than 10 carbon atoms with about 1.0 equivalents of formic acid or a formic acid-producing compound selected from the class consisting of anhydride of formic acid, formic acid salts of ammonia and C_{1-12} alkyl amines, halides of formic acid, formic acid esters of C_{1-12} aliphatic alcohols, formic acid amides, imides and amidines of ammonia and C_{1-12} alkyl amines and combinations of formic acid with said formic acid-producing compounds.

3,907,705

CATALYST FOR HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller, and Horace M. Tenney, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 253,763, May 16, 1972, Pat. No. 3,770,844, which is a continuation-in-part of Ser. No. 1,281, Jan. 7, 1970, Pat. No. 3,677,969, which is a continuation-in-part of Ser. No. 761,792, Sept. 23, 1968, abandoned, and a continuation-in-part of Ser. No. 761,793, Sept. 23, 1968, abandoned, said Ser. No. 761,793, Continuation-in-part of Ser. No. 674,097. This application Apr. 9, 1973, Ser. No. 349,112The portion of the term of this patent subsequent to July 18, 1989, has been disclaimed.
Int. Cl.[2] B01J 31/12, 31/14
U.S. Cl. 252—430 10 Claims

1. A catalyst composition formed by the process of:

impregnating a support containing at least about 0.1 millimoles of hydroxyl groups per gram of support with an aqueous solution of a salt of a transition metal, wherein the transition metal is selected from the group consisting of Group IB, IVB, VB, VIB, VIIB, VIII metals and mixtures thereof;

heat-treating the impregnated support at a temperature of at least about 500°F;

contacting the heat-treated impregnated support with hydrogen sulfide at a temperature in the range of from about 400°F. to about 1000°F.;

activating the heat-treated impregnated sulfided support by contacting same with an organometallic compound having the formula: QR_n wherein Q is a Group I, II or III metal of the Periodic Chart of the Elements, R is selected from the group consisting of hydride, alkyl, aryl, alkylaryl, arylalkyl and cycloalkyl radicals containing from 1 to about 20 carbon atoms and wherein n ranges from 1 to 3 and satisfies the valance of Q; and

treating the activated supported sulfide metal complex in the presence of hydrogen at a temperature of at least about 300°F.

3,907,706

LATENT CATALYST SYSTEMS FOR CATIONICALLY POLYMERIZABLE MATERIALS

Janis Robins, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 6, 1973, Ser. No. 377,026
Int. Cl.[2] B01J 31/04, 31/18, 31/20
U.S. Cl. 252—431 C 12 Claims

1. In combination as a catalyst system soluble in the material to be catalyzed, 1) one equivalent of metal salt selected from the group consisting of lithium, sodium, calcium, strontium, silver, barium, and lead salts of a fluoroalkylsulfonyl acid selected from the group consisting of fluoroalkane sulfonic acids and bis(fluoroalkylsulfonyl)-methanes; and 2) about 0.2 to about 2 equivalents of thermally decomposable ester reaction product of a tertiary alkyl alcohol and an acid that forms a chelation complex with the metal cation of said

metal salt, the ester reaction product decomposing upon heating to release the chelating acid for complexing with the metal cation, whereby catalytic activity is initiated.

3,907,707

VANADIUM CATALYSTS MADE WITH A TRIVALENT PHOSPHORUS COMPOUND

Harold Raffelson, Olivette; Roberto Lee, St. Louis, and Thomas J. Dolan, Arnold, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1973, Ser. No. 342,325

Int. Cl.[2] B01J *27/14*

U.S. Cl. 252—437 **10 Claims**

1. In a process for preparing a phosphorus-vanadium-oxygen catalyst wherein a pentavalent vanadium compound is contacted with a phosphorus compound under conditions to provide a substantial amount of tetravalent vanadium and to form a phosphorus-vanadium-oxygen precursor, the improvement which comprises contacting the pentavalent vanadium compound with a trivalent phosphorus compound.

3,907,708

MULTI-LAYER SUPPORTED CATALYSTS OF THE PLATINOID FAMILY

Roger Claude Lacroix, Suresnes, France, assignor to Comptoir Lyon-Alemand-Louyot, Paris, France

Filed Mar. 16, 1973, Ser. No. 342,087

Claims priority, application France, Mar. 17, 1972, 72.09533

Int. Cl.[2] B01J *27/02, 35/00*

U.S. Cl. 252—439 **15 Claims**

1. A multi-layered supported catalyst comprising a metal or metal alloy support, said support covered, at least partially, by a layer of at least one metal aluminide, wherein the metal of said metal aluminide is selected from the group consisting of cobalt, nickel, iron, chromium and mixtures thereof; said metal aluminide layer covered with a layer of α-alumina at least 10 microns thick and said α-alumina layer supporting a catalytic surface layer of a metal, metal oxide or metal sulfide, wherein said metal of said catalytic surface layer is a metal selected from the platinoid family or mixtures thereof.

3,907,709

ESTERIFICATION CATALYSTS

Ferdinand List, and Kurt Wember, both of Marl, Germany, assignors to Chemische Werke Hüls Aktiengeseilschaft, Germany

Filed Aug. 20, 1973, Ser. No. 389,793

Claims priority, application Germany, Sept. 2, 1972, 2243240

Int. Cl. B01j *11/40;* **C01b** *33/70*

U.S. Cl. 252—453 **14 Claims**

1. In the method for preparing active, highly abrasionfree and mechanically stable silica gel esterification catalysts from an inorganic oxide gel obtained by forming a hydrosol or inorganic oxide characterized by an inherent capacity to set to a hydrogel upon the lapse of a suitble period of time without addition to or subtraction from said sol of any substance, admitting said sol in the form of separate globules to a body of a fluid medium substantially immiscible with water in which said globules assume spherical shape due to surface tension at the interface between said sol and said fluid medium, said medium being maintained at a temperature below the boiling point of said sol, retaining said spheriodal globules in said medium until gelation occurs, retaining in said globules substantially all the constituents of said sol until gelation occurs, washing the spheroidal hydrogel and drying the washed hydrogel, the improvement comprising:

a. impregnating said inorganic oxide gel with a solution of a metallic compound selected from the group consisting of aluminum organic compounds having 3 to 18 carbon atoms, sodium aluminate, potassium aluminate, titanium organic compounds having 4 to 24 carbon atoms, zinc organic compounds having 2 to 12 carbon atoms and tin organic compounds having 4 to 24 carbon atoms;

b. removing excess solution; and

c. drying the impregnated inorganic oxide gel to form said active, highly abrasion-free and mechanically stable silica gel esterification catalysts.

3,907,710

HOLLOW CERAMIC PELLETS FOR CATALYST SUPPORT

Christian Bent Lundsager, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Apr. 18, 1973, Ser. No. 352,165

Int. Cl.[2] B01J *23/10, 23/56*

U.S. Cl. 252—455 R **4 Claims**

1. A catalyst for converting carbon monoxide, hydrocarbons and nitrogen oxides in auto exhaust gases to innocuous entities consisting essentially of platinum or palladium distended as a coating of alumina containing about 5 to 20 weight percent ceria on a porous tubular ceramic support with internal reinforcing ribs, having a diameter of about 3 to 12 mm and a length about equal to the diameter said support characterized by:

a. a geometric surface area of about at least 50% greater than a hollow tube of the same diameter,

b. a surface area approximately 3 times greater than the surface area of solid particles,

c. a crush strength of at least 10 pounds, and,

d. a microporosity of 20 to 50% by volume.

3,907,711

CRYSTALLINE ZEOLITE SYNTHESIS PRETREATMENT

Kenneth L. Riley, Baton Rouge, La., and Dale D. Maness, Austin, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 18, 1973, Ser. No. 380,094

Int. Cl.[2] B01J *29/06;* **C01B** *33/28*

U.S. Cl. 252—455 Z **12 Claims**

11. In a method for preparing a crystalline aluminosilicate zeolite which comprises treating an initial crystalline aluminosilicate zeolite with an aqueous alkali metal hydroxide solution so that at least a portion of said initial crystalline aluminosilicate zeolite is converted into a final crystalline aluminosilicate zeolite having a lower SiO_2/Al_2O_3 mole ratio and a final crystal structure different from that of said initial crystalline zeolite, said difference in structure characterized by a final X-ray diffraction pattern containing X-ray lines which did not appear in the X-ray diffraction pattern of said initial crystalline zeolite, the improvement which comprises contacting said initial crystalline aluminosilicate zeolite with a cation-leaching solution selected from the group consisting of solutions of acids, cationic complexing agents, and mixtures thereof, in the presence of added alumina.

3,907,712

CATALYST COMPOSITION FOR THE PREPARATION OF UNSATURATED CARBONYL COMPOUNDS

Takashi Ohara; Michio Ueshima, both of Nishinomiya, and Isao Yanagisawa, Ikeda, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 399,517, is a division of Ser. No. 146,848, May 19, 1971, Pat. No. 3,825,600. This application Feb. 19, 1974, Ser. No. 443,745

Claims priority, application Japan, May 26, 1970, 45-44531

Int. Cl.[2] B01J *21/08, 23/30*

U.S. Cl. 252—456 **3 Claims**

1. A catalyst composition consisting essentially of a catalytic complex metal oxide consisting essentially of oxygen and the metallic elements Co, Fe, Bi, W, Mo, Si and Z in which the atomic ratio among said metallic elements, Co:Fe:Bi:W:Mo:Si:Z is within the range of 2.0–20.0:0.1–10.0:0.1–10.0:0-

.5–10.0:2.0–11.5:0.5–15.0:0.005–1.0, with the proviso that W plus Mo equals 12.0, and Z represents an alkali metal.

3,907,713

SUPERIOR CATALYST PREPARED BY IMPREGNATION OF PREFORMED MATRIX

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Maria Friedrich, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 2, 1973, Ser. No. 329,034
Int. Cl.² B01J *23/10*
U.S. Cl. 252—462 **8 Claims**

1. A process for preparing an oxidation catalyst comprising the steps of: (a) impregnating a catalytic oxide matrix containing at least the oxides of cobalt and molybdenum, magnesium and molybdenum, nickel and molybdenum, manganese and molybdenum or mixture thereof with water containing a compound of bismuth, iron, tellurium, individually or mixture thereof that is at least partially soluble in the water; and (b) heating the impregnated matrix from step (a) at an elevated temperature to form an active catalyst.

3,907,714

CATALYST FOR REDUCING NITROGEN OXIDES

William A. Compton; Joseph F. Nachman, and Manfred I. Seegall, all of San Diego, Calif., assignors to International Harvester Company, San Diego, Calif.

Filed Nov. 16, 1973, Ser. No. 416,530
Int. Cl.² B01J *23/10*
U.S. Cl. 252—462 **13 Claims**

1. A catalytically active alloy, comprising nominally, by weight, from 65 to 85 percent nickel, from 0.01 to 1 percent rare earth metal or mixture of rare earth metals, and the balance copper.

3,907,715

PROCESS FOR PRODUCING METAL CONTAINING COMPOSITION

Tomio Arai, Zushi; Suguru Fukui, Tokyo; Tatsuo Morimoto; Hajime Kitazato, both of Yokohama, and Tohru Yokoyama, Sagamihara, all of Japan, assignors to Chiyoda Kako Kensetsu Kabushiki Kaisha, Yokohama, Japan

Continuation-in-part of Ser. No. 858,174, Sept. 15, 1969, abandoned. This application Feb. 23, 1973, Ser. No. 335,403
Claims priority, application Japan, Sept. 14, 1968, 43-66501
Int. Cl. B01j *11/16, 11/22*
U.S. Cl. 252—465 **9 Claims**

1. A process for producing a dispersed system composed of alumina and one or more metals having higher single electrode potentials than that of aluminum or the oxides of such metals comprising the steps of drying and calcining an aqueous solution of one or more water soluble metal complexes containing aluminum and one or more metals having a higher standard reduction single electrode potential than that of aluminum and represented by the formula:

$$Al_nM_{n'} \quad (OH)_mX_{3n+p-m}$$

wherein n represents the number of aluminum atoms and falls within the range of 1 to 400; M represents one or more metals; n' the total number of M atoms, said number falling within the range of 1 to 17; m the number of OH groups, m being in the range of 2 to 1000; X one or more monovalent anions other than OH groups; p the sum total of M valencies and $3n+p-m$ the total number of X anions; and wherein n, n', p and m are such that $n \geq 1$, $n/n' \geq 1$ and $3n+p > m$.

3,907,716

COPPER OXIDATION CATALYSTS AND METHOD FOR PREPARING THE SAME

Gottfried C. Haacke, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 22, 1974, Ser. No. 453,618
Int. Cl.² B01J *23/34*
U.S. Cl. 252—471 **7 Claims**

1. A compound having the structure:

$$Cu_x\ CO_y\ Mn_z\ O_4$$

where x is 0.1 to 0.6, y is 1.4 to 2.6, z is 0.3 to 1.0 and where $x+y+z$ equals 3.

3,907,717

ACRYLIC RESISTIVE COATING COMPOSITION

James Michael Hebert, Humboldt, Iowa, assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Aug. 24, 1973, Ser. No. 391,285
Int. Cl.² H01B *1/06*
U.S. Cl. 252—508 **24 Claims**

1. A heat-curable, electrically resistive coating composition which is solvent free and capable of being screen applied to a dielectric base comprising a thermosetting acrylic resin present in an amount of about 35 to about 70% by weight, a carbon or graphite conductor present in an amount of about 3 to about 60% by weight and an amount of an organic curing agent sufficient to effect cross-linking of said resin, said composition having low resistivity and capable of being fired onto said dielectric substrate at a temperature of at least about 700°F.

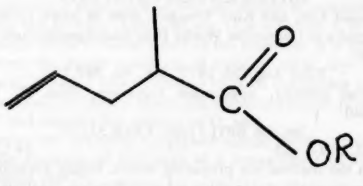
3,907,718

2-METHYL-4-PENTENOIC ACID ESTER FRAGRANCE

John B. Hall, Rumson; Ching Y. Tseng, Middletown; Manfred Hugo Vock, Locust; Joaquin Vinals, Red Bank, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed July 22, 1974, Ser. No. 490,718
Int. Cl.² A61K *7/00*
U.S. Cl. 252—522 **3 Claims**

1. A fragrance modifying composition comprising a compound having the structure:



wherein R is hydrogen or one of C_2—C_6 alkyl and an auxiliary perfume ingredient.

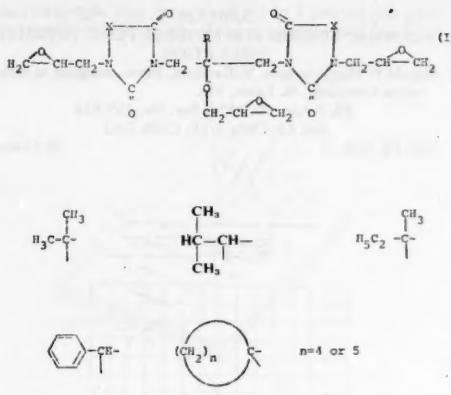
3,907,719

HETEROCYCLIC TRIGLYCIDYL COMPOUNDS

Juergen Habermeier, Pfeffingen, and Daniel Porret, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 238,982, March 28, 1972, Pat. No. 3,821,243. This application Mar. 14, 1974, Ser. No. 451,256
Claims priority, application Switzerland, Apr. 14, 1971, 5398/71
Int. Cl.² C08G *59/34*
U.S. Cl. 260—2 EC **3 Claims**

1. A curable mixture consisting essentially of (a) at at least one compound of the formula



and R is hydrogen or alkyl of 1 to 4 carbon atoms; and (b) an epoxy resin curing agent.

3,907,720

INSOLUBLE POROUS POLYMERIC IODINE COMPLEXES USEFUL AS BACTERICIDES

Nathan D. Field, Allentown, and Earl P. Williams, Argyl, both of Pa., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 875,516, Nov. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 736,302, June 12, 1968, abandoned. This application Aug. 10, 1972, Ser. No. 279,731

Int. Cl. C08d *13/08*

U.S. Cl. 260—2.5 R **9 Claims**

1. An iodine complex of a water-insoluble but water-swellable crosslinked polymer of N-vinyllactam of N-lower alkyl-N-vinylamide monomer and about 0.1 to about 20% by weight of a crosslinking agent containing at least two functional groups capable of taking part in the polymerization reaction, said crosslinking agent being selected from the group consisting of alkylenebisacrylamides, alkylene glycol dimethacrylates, divinylbenzene, divinyl ethylbenzene, divinylchlorobenzene, divinyltoluene, divinylnaphthalene, allyl acrylate, p-isopropenylstyrene, trivinyl trimesate, diallylmaleate, divinyl ether, 1,3-divinyl oxybutane, 1,4-divinyl oxybutane, trivinyl citrate, divinyl o-phenylene diacetate, vinyl allyl ether, diethylene glycol diallyl ether, trivinyl glyceryl ether, divinyl glyceryl ether, tetravinyl pentaerythrityl ether, hexahydro-1,3,5-triacyl-s-triazine and vinylpyrrolidone dimer, said polymer being in the form of porous beads or granules and said complex containing from about 2 to about 40% available iodine.

3,907,721

HIGH RESILIENCY, FLEXIBLE POLYURETHANE FOAMS AND CROSSLINKERS FOR THE PREPARATION THEREOF

Arthur E. Gurgiolo, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 410,138, Oct. 26, 1973. This application Mar. 4, 1974, Ser. No. 448,165

Int. Cl.[2] C08G *18/32, 18/48, 18/14*

U.S. Cl. 260—2.5 AM **10 Claims**

1. A flexible polyurethane foam having a resiliency greater than about 50%, a modulus of at least about 2.3 and a density of less than about 5 lbs/ft^3 resulting from subjecting to foaming conditions, a composition which comprises

A.

1. from about 50 to 100 parts by weight of a primary hydroxyl-containing polyether triol containing an end-cap of at least 1 mole of ethylene oxide per hydroxyl group and having an average hydroxyl equivalent weight of from about 900 to about 2500;
2. from 0 to about 50 parts by weight of a polyol selected from a diol, a triol, or mixtures thereof wherein said diols and triols have an average hydroxyl equivalent weight of from about 900 to about 2500;

B. an organic polyisocyanate consisting of

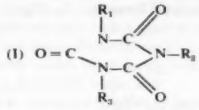
1. from about 50 to 100% by weight of 2,4-toluene diisocyanate; 2,6-toluene diisocyanate; NCO-containing prepolymers thereof or mixtures thereof and
2. from 0 to about 50% by weight of an organic polyisocyanate having an average NCO functionality of at least 2;

C. from about 1.0 to about 5 parts by weight of water per 100 parts by weight of Component (A);

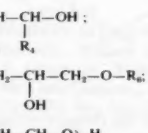
D. from about 0 to about 20 parts of a low boiling auxiliary blowing agent per 100 parts by weight of Component (A);

E. from about 1 to about 10 parts per 100 parts by weight of Component (A) of a crosslinker composition consisting essentially of

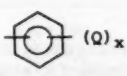
1. from 30 to 100 percent by weight of a primary crosslinker component represented by the general formula



wherein each R_1, R_2 and R_3 is independently selected from the formulas



wherein R_4 and R_5 are selected from the group consisting of hydrogen, methyl, ethyl, halo-methyl, and phenyl with the proviso that when one of R_4 and R_5 is ethyl, halomethyl, or phenyl the other is hydrogen; R_6 is selected from the group consisting of allyl, methallyl or a group represented by the formula



wherein Q is a halogen or an alkyl group and x has a value of 1 when Q is an alkyl group and a value of 1 or 2 when Q is a halogen or x has a value of zero; wherein R_7 and R_8 are selected from the group consisting of hydrogen, methyl, $—CH_2—O—R_6$, and phenyl with the proviso that only one of R_7 or R_8 can be hydrogen and with the further proviso that when one of R_7 or R_8 is $—CH_2—O—R_6$ or phenyl the other is hydrogen; and n has a value of 1, 2 or 3; with the proviso that no more than 2 of the R_1, R_2 and R_3 groups can be represented by the formula II when R_4 or R_5 is hydrogen, methyl, or halomethyl when the other is hydrogen;

2. from 0 to about 70 percent by weight of an auxiliary crosslinker component;

F. from about 0.5 to about 4 parts by weight per 100 parts

by weight of Component (A) of a catalyst for urethane formation;

G. from about 0.005 to about 1.5 parts by weight per 100 parts by weight of Component (A) of a silicone oil cell control agent;

and wherein Components (A), (B), (C) and (E) are present in quantities so as to provide an NCO:active hydrogen equivalent ratio of from about 0.8:1.0 to about 1.3:1.0.

3,907,722

FLAME RETARDANT POLYURETHANES CONTAINING CHEMICALLY COMBINED 3,4-DIBROMOCYCLOHEXANE DIOLS

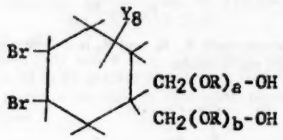
Anthony Joseph Papa, St. Albans, W. Va., and William Robert Proops, Claymont, Del., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 172,262, Aug. 16, 1971, Pat. No. 3,833,665. This application May 20, 1974, Ser. No. 471,499

Int. Cl.[2] C08G *18/14, 18/32, 18/50, 18/65*

U.S. Cl. 260—2.5 AM **18 Claims**

1. A flame-retarded polyurethane having chemically combined therein a 3,4-dibromocyclohexane diol having the following average structural formula,



wherein:

Y is a member of the class consisting of hydrogen, an alkyl radical having up to 6 carbon atoms, and a phenyl radical;

R designates a bivalent hydrocarbon radical having from 2 to 10 carbon atoms; and

a and *b* each has the value of from 0 to about 12, and the sum *a+b* is zero or a positive number having an average value no greater than about 12.

3,907,723

PHENOLIC RESINS

Monique Pretot, Creil, France, assignor to Certain-teed Products Corporation, Valley Forge, Pa.

Filed May 7, 1969, Ser. No. 822,713

Claims priority, application France, May 9, 1968, 68.151171

Int. Cl.[2] C08J *9/00*

U.S. Cl. 260—2.5 F **2 Claims**

1. A method of making a non-corrosive acid-catalyzed non-flammable self-extinguishing phenol-formaldehyde resin which comprises mixing a liquid phenol-formaldehyde resin containing a ratio of formaldehyde to phenol of at least two, with from 5 to 8 percent by weight based on the resin of resorcinol, an organic liquid blowing agent having a boiling point from about 22°to 80°C., and about 10 percent by weight of dicyandiamide-formaldehyde and about 10 percent by weight of a 35 percent aqueous solution of HCl.

3,907,724

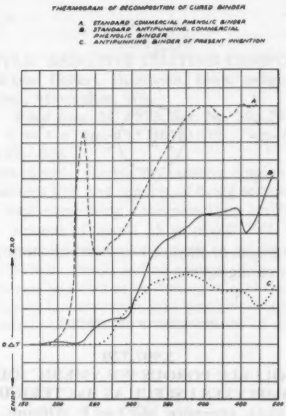
PHENOLIC BINDERS FOR MINERAL FIBER THERMAL INSULATION

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 10, 1974, Ser. No. 459,524

Int. Cl. C08g *5/18;* **C08h** *7/02*

U.S. Cl. 260—7 **20 Claims**



1. An aqueous phenolic resin system which comprises:

A. a modified resole comprising a phenol-formaldehyde condensate and a dicyandiamide-formaldehyde or a melamineformaldehyde condensate wherein the mole ratio of phenol to dicyandiamide or melamine is in the range of 1:0.2 to 1:1.2, wherein there are between 1.5 and 2.5 moles of formaldehyde per mole of phenol, and, additionally, between 0.9 and 2.0 moles formaldehyde per mole of dicyandiamide or melamine,

B. an etherified methylolaminotriazine wherein the degree of methylolation is at least 1.5, the degree of etherification is at least 0.5, and the etherification agent is an alcohol containing from 1 to 4 carbon atoms, and

C. a proteinaceous compound soluble in aqueous media at a pH of 7 to 10; wherein the weight ratio of the modified resole to the etherified methylolaminotriazine is in the range of 10:1 to 1:2 and wherein the weight ratio of the proteinaceous compound to the modified resole and the etherified methylolaminotriazine is in the range of 1:1000 to 1:20.

3,907,725

ASBESTOS-FREE DRYWALL JOINT COMPOUND UTILIZING ATTAPULGITE CLAY AS ASBESTOS SUBSTITUTE

William B. Forte, Williamsville, and Patrick J. Mudd, Buffalo, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

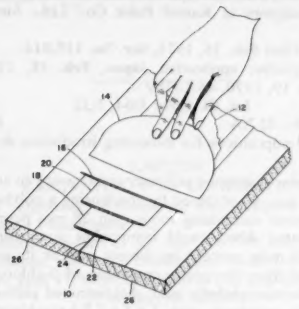
Filed Feb. 26, 1973, Ser. No. 335,619

Int. Cl.[2] C08L *1/28;* **C08K** *3/00;* **C08J** *3/20*

U.S. Cl. 260—17 R **9 Claims**

1. A drywall joint compound, said compound being free of asbestos fiber, and comprising as dry solids, by weight, from about 50 to 99 percent of fine ground powdered fillers of about minus 325 mesh particle size and other than attapulgite clay, from about 1 to 50 percent of a binder composition for said filler, from about 0.1 to 5 percent of a thickener other

than attapulgite clay, from about 0.1 to 5 percent fine powdered attapulgite clay and a flocculating agent for said clay in an



amount of about 0.1 to 5.0 parts by weight for every 10 parts by weight of attapulgite clay.

3,907,726

BIOLOGICALLY DISINTEGRABLE RESIN MOLDING COMPRISING CARBOXYMETHYL CELLULOSE AND INORGANIC FILLER

Shinichi Tomiyama, No. 14-2, Onigoe 1-chome, Ichikawa, Chiba, Japan

Filed Mar. 19, 1973, Ser. No. 342,676

Claims priority, application Japan, Mar. 24, 1972, 47-29530

Int. Cl. C08b *21/32*

U.S. Cl. 260—17 R **7 Claims**

1. A synthetic resin molded object that is biologically disintegrable, made of a uniformly blended mixture consisting essentially of,

A. from 1 to 10 percent by weight of fine particles of an organic substance that is decomposable by soil microorganisms or activated sludge microorganisms,

B. from 40 to 90 percent by weight of particles of inorganic filler selected from the group consisting of diatomaceous earth, calcium carbonate, white carbon, talc, clay, calcium sulfate hemihydrate, anhydrous calcium sulfate and calcium sulfite, and

C. the balance is synthetic resin selected from the group consisting of polyolefins and blends of polyolefins with polyvinyl acetate, the amount of said synthetic resin being effective to provide the structural integrity of the molded object.

3,907,727

PROCESS FOR DISPERSING CARBON BLACK IN ACRYLATE PLASTICS

Hayden Ivan Lipp, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1974, Ser. No. 527,065

Int. Cl.² C08J *3/22;* **C08K** *3/04;* **C08L** *1/18*

U.S. Cl. 260—17 R **10 Claims**

1. A process for preparing tinted article of acrylate polymeric material comprising

a. mixing a dispersion of

1. not more than 50% by weight, based upon the total weight of said dispersion, of a concentrate of not more than 20% by weight, based upon the total weight of said concentrate, of furnace carbon black and, complementally, not less than 80% by weight, based upon the total weight of said concentrate, of an acrylate polymer,

2. not less than 50% by weight, based upon the total weight of said dispersion, of methyl methacrylate or methyl methacrylate sirup, and

3. at least 0.01% by weight, based upon the total weight of said dispersion, of nitrocellulose;

b. adding a polymerization catalyst to said dispersion and casting said dispersion on a substrate followed by heating said dispersion to a temperature of at least 50°C. to cure said dispersion and thereby provide said article of acrylate polymeric material.

3,907,728

THERMOSETTING ADHESIVE COMPOSITIONS EXTENDED WITH CELLULOSIC PAPER MILL SLUDGES

Alan L. Lambuth, Boise, Idaho, and William Montgomery Hearon, Portland, Oreg., assignors to Boise Cascade Corporation, Boise, Idaho

Filed Oct. 12, 1973, Ser. No. 406,002

Int. Cl.² C08G *51/18*

U.S. Cl. 260—17.2 **15 Claims**

1. A thermosetting resinous adhesive composition comprising:

a. at least one thermosetting resin of the class consisting of the thermosetting phenol-formaldehyde resins, phenol-resorcinol-formaldehyde resins, and resorcinol-formaldehyde resins,

b. an extender for the resin comprising an aqueous cellulosic pulp hydrated to a freeness of not over 400 cc. Canadian Standard Freeness and having a content of cellulosic fibers a preponderant proportion of which have maximum lengths of not over about one-eighth inch,

c. the resin and extender being used in relative proportions of from about one to about 50 parts extender for each one hundred parts resin, parts being expressed as parts by weight on a dry solids basis, and

d. water used in amount sufficient to impart to the composition a viscosity of from about 1,000 to about 12,000 centipoises.

3,907,729

SHORT FIBER REINFORCED SPINDLE DRIVE WHEEL

David J. Burkey, Millersville; William L. Mason, Willow Street, and Robert S. Olcott, Jr., Millersville, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 30, 1974, Ser. No. 437,829

Int. Cl. C08g *51/18*

U.S. Cl. 260—17.2 **2 Claims**

1. A spindle drive wheel for driving a false twist spindlette, said drive wheel being rod shaped and being formed from a vulcanized butadiene-acrylonitrile rubber composition which contains extremely short fibers of wood cellulose material having a length ranging from 76 microns to 150 microns, said rubber composition being approximately 100 parts by weight with said cellulose material being approximately 50–100 parts by weight.

3,907,730

RESINOUS INITIATOR SUSPENSION FOR OLEFINIC POLYMERIZATION REACTIONS

Richard A. Jones, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

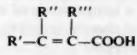
Filed Sept. 27, 1973, Ser. No. 401,366

Int. Cl.² C08F *114/02;* **C08L** *5/00*

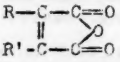
U.S. Cl. 260—17.4 SG **19 Claims**

1. In a process for polymerizing one or more vinylidene monomers having a terminal $CH_2{=}CH<$ grouping wherein said monomer or monomers are dispersed in an aqueous polymerization reaction medium, the improvement which comprises adding a freeradical polymerization initiator to the aqueous polymerization reaction medium in the form of a suspension of said initiator in a water-insoluble, water-swellable lightly cross-linked polymer of one or more olefinically unsaturated carboxylic acid monomers containing sufficient water to form a flowable plastic mass, said cross-linked polymer being produced by solution polymerizing in an organic

solvent at least one carboxylic acid monomer selected from the group consisting of (1) those monomers having the formula



wherein R′ is hydrogen or a COOH group, and each of R″ and R‴is a hydrogen or a monovalent substituent group which is linked to one of the doubly bonded carbon atoms, and (2) those monomers having the formula



wherein R and R′ are monovalent substituent groups selected from hydrogen, halogen, cyanogen (—C N) groups, alkyl, aryl, alkaryl, aralkyl and cycloaliphatic radicals, in the presence of a cross-linking agent which contains a plurality of terminal polymerizable CH_2=C< groups per molecule, said agent being selected from the group consisting of polyunsaturated hydrocarbons, -polyethers, -polyesters, -nitriles, -acids, -acid anhydrides, -ketones, -alcohols, and polyunsaturated compounds incorporating one or more of these functional groups.

3,907,731

AMINE CURABLE POLYEPOXIDE COMPOSITIONS

Ross Gardner, Jr., Stoughton, Mass., assignor to Cabot Corporation, Boston, Mass.

Filed Mar. 5, 1973, Ser. No. 338,067

Int. Cl.² C08K *5/10;* **C08L** *63/00;* **C09L** *91/00*

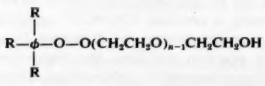
U.S. Cl. 260—18 PF **9 Claims**

1. An epoxy potting composition comprising:

A. between about 26 and about 40 parts by weight of a dihydric phenol/epihalohydrin polyepoxide having a melting point of less than about 50°C and a W.P.E. value of between about 175 and about 280;

B. between about 54 and about 80 parts by weight of a flexibilized polyepoxide composition having a melting point of below about 50°C and a W.P.E. value of between about 325 and about 750, said polyepoxide composition comprising a dihydric phenol/epihalohydrin polyepoxide containing between about 15 and about 30 percent by weight thereof of an internal reactive plasticizer;

C. between about 46 and about 70 parts by weight of an essentially water insoluble alkylphenol/ethylene oxide reaction product conforming to the general formula



wherein each R is any alkyl or hydrogen radical and at least one of which radicals is an alkyl; ϕ is an aromatic ring and n is an integer of from 1 to 4; and

D. an amine curing agent in an amount sufficient to effectuate curing of the composition.

3,907,732

PAINT COMPOSITIONS FOR INDICATING IRRADIATION DOSE

Tsutomu Maruyama, and Koichiro Murata, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Feb. 16, 1971, Ser. No. 115,814

Claims priority, application Japan, Feb. 18, 1970, 45-13423; Feb. 19, 1970, 45-13789

Int. Cl. C09d *3/64, 5/32*

U.S. Cl. 260—22 XA **8 Claims**

1. Paint compositions for indicating irradiation dose comprising:

A. a chlorine-combined polyester resin having an acid value of less than 40 obtained by condensing a polybasic acid component comprising more than 25 mol percent of a chlorinated dibasic acid component comprising more than 25 mole percent by dibasic acid or its anhydride selected from the group consisting of 3-chlorophthalic acid, 4-chlorophthalic acid, dichlorinated phthalic acid, tetrachlorophtharic acid, 1,4,5,6,7,7-hexachlorobicyclo-(2,2,1)-5-heptene-2,3-dicarboxylic acid, 4-chloro-4-cyclohexene-1,2-dicarboxylic acid and anhydrides corresponding to said acids with glycols, and

B. 5 to 30 percent by weight of a reductive discoloring substance and

C. 0.005 to 2.0 percent by weight of a reducing dyestuff.

3,907,733

HOT MELT ADHESIVE COMPOSITIONS

Winston J. Jackson, Jr., Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,650

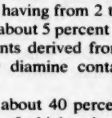
Int. Cl.² B32B *15/08;* **C09J** *3/14*

U.S. Cl. 260—22 D **18 Claims**

1. An adhesive composition comprising

a. from about 95 to about 60 percent by weight of a poly(esteramide) block copolymer having from about 45 to about 95 percent by weight of crystalline polyester segments derived from at least one aliphatic or alicyclic glycol having from 2 to 10 carbon atoms and at least one dicarboxylic acid having from 2 to 20 carbon atoms, and from about 55 to about 5 percent by weight of amorphous polyamide segments derived from a dimer acid and an aliphatic primary diamine containing 2 to 10 carbon atoms, and

b. from about 5 to about 40 percent by weight of a vinyl aromatic polymer of which at least 50 percent by weight of its polymeric units are derived from at least one monomer having the formula



wherein R is hydrogen or an alkyl group containing 1 to 4 carbon atoms and R_1 is hydrogen, chlorine, phenyl or an alkyl group containing 1 to 4 carbon atoms.

3,907,734

METHOD OF PRODUCING POWDERED POLYMERS

Theodore R. Ten Broeck, Hudson, and Raymond E. Downey, Copley, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 11, 1973, Ser. No. 350,236

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23.7 M **9 Claims**

1. A method of making a dry powdery plastic or elastomer composition comprising adding with intimate mixing a fine

stream of a latex of a plastic or elastomer composition in a partitioning agent comprised of a powdery hydrophobic silica to obtain a wet free-flowing particulate mass, and drying the wet particulate mass to obtain a powder.

3,907,735

LAMINATING WAX COMPOSITION

Elmer J. Hollstein, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 706,738, Jan. 16, 1968, abandoned, which is a continuation-in-part of Ser. No. 558,466, June 17, 1966, abandoned. This application Sept. 1, 1970, Ser. No. 68,801

Int. Cl.[2] C08L *91/08*

U.S. Cl. 260—28.5 A **2 Claims**

1. A water resistant fiberboard composition comprising a fibrous sheet coated with a laminating wax composition consisting essentially of petroleum wax and 1–50 percent based on the weight of the mixture of solid atactic propylene-ethylene terminal block copolymer having a molecular weight in the range of 30,000 to 300,000 and containing 1–30 percent by weight of copolymerized ethylene.

3,907,736

FINISHING AGENTS FOR TEXTILES

Kenneth R. Barton, and Raymond N. Vachon, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1974, Ser. No. 471,427

Int. Cl.[2] C08L *67/00*

U.S. Cl. 260—29.4 R **10 Claims**

1. An aqueous blend of components (1), (2) and (3) as follows:

1. from about 50 to about 85 parts by weight of a linear, water-dissipatable polyester derived from components A, B and C as follows:
   - A. at least one dicarboxylic acid,
   - B. at least one diol, at least 20 mole percent of said diol component being a poly(ethylene)glycol having the formula $H—OCH_2CH_2)_nOH$ wherein n is an integer of from 2 to about 14, and
   - C. at least one difunctional dicarboxylic acid sulfomonomer containing a $—SO_3M$ group attached to an aromatic nucleus, wherein M is Na^+, Li^+, K^+, or a combination thereof, said sulfomonomer component constituting at least about 8 mole percent to about 45 mole percent of the sum of the moles of said components (A) and (C).
2. from about 15 to about 50 parts by weight of at least one water-dissipatable amino resin having at least two reactive groups, said resin being selected from the group consisting of melamine-formaldehyde condensates, methylated melamine-formaldehyde condensates, urea-formaldehyde condensates, methylated urea-formaldehyde condensates, guanamine-formaldehyde condensates and methylated quanamine-formaldehyde condensates; and
3. from about 10 to about 100 parts by weight of a water-dissipatable nonionic linear poly(oxyethylene)glycol having the formula (I) $HO(CH_2CH_2O)_mH$ wherein m is an integer from about 4 to about 150, or

(II) $H(OCH_2CH_2)_x(OCH—CH_2)_y(OCH_2CH_2)_zOH$ (with CH_3 on the CH)

wherein x, y, and z are integers, the sum of which results in a glycol having a molecular weight from about 1000 to about 14,000 and the ratio of $x + z$ to y is such that the hydrophile/lipophile balance is from about 4.5 to about 30.5.

3,907,737

METAL COATING COMPOSITION OF WATER INSOLUBLE BINDER AND WATER SOLUBLE THICKENER

Matthias Marx, Bad Durkheim, and Gerhard Storck, Ruchheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 2, 1973, Ser. No. 337,657

Claims priority, application Germany, Mar. 4, 1972, 2210483

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 NR **14 Claims**

1. A metal coating composition consisting essentially of

A. from 40 to 70 percent by weight based on the weight of the composition of water;

B. from 30 to 60 percent by weight based on the weight of the composition of at least one heat-curable binder which is insoluble or at the most slightly swellable in water, and which is dispersed in component A in the form of particles having a size of from 0.1 to 150 microns; this binder being a synthetic resin selected from the group consisting of
   - a. polymerized ethylenically unsaturated monomers,
   - b. 1, 2 epoxy resins obtained by reaction of polyhydroxy compounds with epichlorohydrin,
   - c. saturated and unsaturated polyesters from a polycarboxylic acid and a polyhydric alcohol,
   - d. amino resins, said amino resins being crosslinkable urea-, melamine- or benzoquanamine-formaldehyde precondensates, and
   - e. polyurethane forming mixtures of blocked polyisocyanates and saturated polyesters with OH numbers of from 20 to 250: and

c. from 0.1 to 5% by weight based on the weight of the composition of at least one thickener dissolved in water, which has a viscosity of from 0.5 to 50 centipoises in a 0.015% aqueous solution at 20°C: said thickener being an organic polymeric material selected from the group consisting of
   - a. salts of polyacrylic acid,
   - b. carboxymethylcelluloses,
   - c. methylcelluloses,
   - d. polyvinylpyrrolidone,
   - e. polyacrylamide,
   - f. polymethacrylamide,
   - g. polymers of ammonium acrylate, ammonium methacrylate or dimethylammonium hydrochloride.

3,907,738

AQUEOUS SOLUTION OF ELECTROCONDUCTIVE RESINS AND PROCESS OF PREPARATION

Albert H. Markhart, Wilbraham, and James O. Santer, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

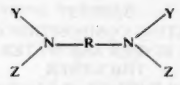
Continuation-in-part of Ser. No. 253,016, May 15, 1972, Pat. No. 3,825,511. This application July 5, 1974, Ser. No. 486,134

Int. Cl.[2] C08F *45/24, 45/44*

U.S. Cl. 260—29.6 R **21 Claims**

1. A process of manufacture of an aqueous solution of a poly(quaternary ammonium) resin comprising dispersing substantially equimolar quantities of a 1,4-dihaloalkene-2 and

a di(tertiary amine) in water or water-containing up to 30 weight percent of a C_1 to C_3 alkanol, and heating the dispersion at a temperature in the range of 25° to 100° C. until the reaction between the 1,4-dihaloalkene-2 and the di(tertiary amine) is substantially complete, wherein the 1,4-dihaloalkene-2 is selected from the group consisting of the 1,4-dibromo- and 1,4-dichloro substitution products of butene-2, pentene-2, hexene-2, 2-methylbutene-2, 2-chlorobutene-2 and cyclopentene-2, and wherein the di(tertiary amine) has the general formula:



wherein N represents nitrogen, R is a phenylene radical, a xylylene radical or a divalent saturated or unsaturated alkylene radical of 2 to 6 carbon atoms optionally substituted with methyl or hydroxyl substituents, Y is an alkyl radical selected from the group consisting of C_1 to C_4 alkyl, C_1 to C_4 hydroxyalkyl and when R is an ethylene radical, methylene so that the Y radicals form an ethylene bridge between the nitrogen atoms, and Z is an alkyl radical selected from the group consisting of C_1 to C_4 alkyl, C_1 to C_4 hydroxyalkyl and when R is an ethylene radical, methylene so that the Z radicals form an ethylene bridge between the nitrogen atoms.

3,907,739

NON-ELASTOMERIC POLYURETHANE COMPOSITIONS PREPARED IN THE PRESENCE OF A SULPHONE

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,835, June 4, 1973, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,478

Int. Cl.² C08G *18/06*

U.S. Cl. 260—30.8 R **19 Claims**

1. A non-elastomeric, solid polymer having a density of at least about 1 gram/cc and a percent elongation less than 80 resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230,

B. an organic polyisocyanate,

C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of linear sulfones, cyclic sulfones and mixtures thereof, and

D. a non-amine-containing catalyst for urethane formation, which is an organo metal compound;

wherein components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, component (C) is present in quantities of from about 20 to about 50 percent with the proviso that when component (B) is an NCO-containing prepolymer containing less than about 40% NCO by weight, component (C) is present in quantities of from about 10% to about 50% by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.2 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes, without the application of an external source of heat, after admixture of said composition.

3,907,740

STABLE, HIGH SOLIDS METHYLATED UREA-FORMALDEHYDE COATING COMPOSITIONS

Werner Josef Blank, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. Nos. 222,322, Jan. 31, 1972, abandoned, and Ser. No. 407,118, Oct. 17, 1973, abandoned. This application June 10, 1974, Ser. No. 482,397

Int. Cl.² C08K *5/10*

U.S. Cl. 260—33.4 R **10 Claims**

1. A solution consisting essentially of (A) 80% to 10% by weight of a syrupy mixture of thermosetting methylated urea-formaldehyde condensates composed of inter-reacted urea, formaldehyde and methanol in 1 : 2–3 : 1–2.5 molar ratio respectively, wherein 10 to 60% by weight of said mixture is monomeric, 10 to 75% by weight is dimeric, 5 to 60% by weight is trimeric, and 10 to 30% by weight is in excess of trimeric, said percentages totalling 100; and (B) 20 to 90% by weight of a branched-chain C_3–C_{18} polyhydric compound having a molecular weight less than 500.

3,907,741

NONAQUEOUS DISPERSIONS OF THERMOSETTING FILM FORMING POLYMERS

David L. Maker; Stephen C. Peng, both of Rochester, and David M. Thomson, Mount Clemens, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 240,789, April 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 82,130, Oct. 19, 1970, abandoned. This application Aug. 6, 1973, Ser. No. 385,505

Int. Cl.² C08J *3/08, 3/10;* **C08K** *5/01;* **C08L** *61/28*

U.S. Cl. 260—33.6 UA **8 Claims**

1. A process for preparing a nonaqueous dispersion of a thermosetting film-forming polymer comprising in combination

1. dissolving an alkylated condensation product of an amine and an aldehyde having a mineral spirits tolerance at 60 percent solids in butanol of at least about 400 in an aliphatic hydrocarbon solvent which distills at temperatures above about 85°C.

2. adding to said solution a first active ethenic monomer having a functional epoxy group and a second active ethenic monomer in relative quantities such that the epoxy functional active ethenic monomers constitute between about 5 and about 40 weight percent of the total of ethenic monomers added, said active ethenic monomers being readily polymerizable by free radical initiated polymerization and being free of functional hydroxy groups, and

3. copolymerizing said active ethenic monomers in the presence of said alkylated condensation product and a free radical initiator while maintaining said solution at a temperature above about 80°C. and under agitation until said active ethenic monomers form a polymeric material that is insoluble in said solvent and dispersed through said aliphatic hydrocarbon solvent in a quantity such that said alkylated condensation product constitutes about 10 to about 50 weight percent of the total polymeric solids within the resultant dispersion.

3,907,742

SILICONE MOLDING COMPOSITIONS

Yasuhisa Tanaka; Noboru Shimamoto, and Kiyoshi Yokokawa, all of Annaka, Japan, assignors to Shinetsu Chemical Company, Japan

Filed June 18, 1974, Ser. No. 480,423

Claims priority, application Japan, June 21, 1973, 48-70195

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 SB **8 Claims**

1. A silicone resin molding composition which comprises

1. 100 parts by weight of a vinyl-containing block-copolymerized organopolysiloxane resin represented by the average formula

$$\left[(CH_3)_a(C_6H_5)_b(CH_2{=}CH)_cSiO_{\frac{4-a-b-c}{2}}\right]_x\left[(CH_3)_2SiO\right]_{1-x}$$

where a=0.10 to 0.20, b=0.50 to 0.80, c=0.25 to 0.40 and x =0.60 to 0.80, with the proviso that (a+b+c) = 1.00 to 1.30, the content of the residual silanolic hydroxy groups being from 0.3 to 1.0 percent by weight and the dimethylsiloxane units being successively linked blocks in linear siloxane chain or chains having a degree of polymerization of from 10 to 40,
2. from 200 to 400 parts by weight of a reinforcing filler,
3. catalytic amount of an organic peroxide, and
4. catalytic amount of a condensation catalyst.

3,907,743
MELT SPINNING METHOD OF POLYAMIDE YARN

Michio Goto; Shogo Ito, and Atuio Tanaka, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 7, 1971, Ser. No. 178,430
Int. Cl.² C08G *85/00*
U.S. Cl. 260—45.75 C **4 Claims**

1. A method to reduce build-up of carbonized material on the surface of a spinneret during spinning of synthetic linear polyamides having recurring amide groups consisting of

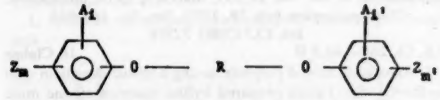
spinning a polyamide composition comprising a polyamide containing from about 0.001 to about 0.05% by weight of the polyamide of a compound selected from the group consisting of
magnesium acetate,
magnesium chloride,
magnesium bromide, and
magnesium nitride, and
from about 0.05 to about 5% by weight of the polyamide of a compound selected from the group consisting of
dithiocarbamate metallic salts,
thiodialkanoic acid esters,
2-mercaptobenzimidazol,
2-mercaptobenzimidazol metal salts,
and
2,2'-dibenzimidazol disulfide.

3,907,744
POLYESTER PLASTIC COMPOSITIONS CONTAINING BIS-PHENOXY FLAME RETARDANTS

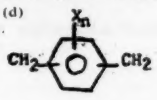
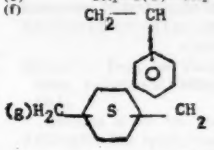
Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.

Continuation-in-part of Ser. No. 260,740, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,860
Int. Cl. C08g *51/60*
U.S. Cl. 260—45.9 R **14 Claims**

1. A plastic composition containing polyester having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; m and m' are integers having a value of 1–5; i and i' are integers having a value of 0–2; A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halobenzyl; and R is selected from the group consisting of

(a) CH_2—CH(OH)—CH_2
(b) CH_2—CH(CH_2OH)—CH_2
(c) $(CH_2)_w$—O—$(CH_2)_w$ where w = 1—6
(d)  where X = H, Cl, Br n = 4
(e) CH_2—C(O)—CH_2
(f)  where S = saturated ring

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3,907,745
ANTIOXIDANT SYSTEMS CONTAINING CHELATING AGENTS

Lewis Bsharah, and Walter R. May, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 26, 1970, Ser. No. 84,183
Int. Cl.² C08J *3/20;* **C08G**
U.S. Cl. 260—45.9 AA **4 Claims**

1. An antioxidant system comprising (1) an antioxidant selected from the group consisting of a staining antioxidant and a non-staining antioxidant and (2) an oxyalkylated o-phenylene-diamine as a chelating agent, said oxyalkylated o-phenylene-diamine being o-phenylene-diamine oxyalkylated with (i) ethylene oxide, (ii) propylene oxide or (iii) ethylene oxide and propylene oxide.

3,907,746
STABILIZED POLYAMIDES

Gordon William Follows, Manchester, England, assignor to Imperial Chemical Industries, Inc., London, England

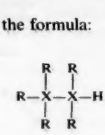
Division of Ser. No. 228,717, Feb. 23, 1972, Pat. No. 3,839,392, which is a continuation-in-part of Ser. No. 28,498, April 14, 1970, abandoned. This application July 5, 1974, Ser. No. 486,129
Int. Cl.² C08G *6/00*
U.S. Cl. 260—45.95 R **5 Claims**

1. A heat-stabilized polyamide composition comprising a synthetic linear polyamide having re-occuring amide groups as integral parts of the main chain, and stabilizing amounts of a hydride selected from

a. compounds of the formula:

wherein each R independently represents a hydrogen atom or an alkyl, cycloalkyl, aralkyl or aryl group and X represents a silicon atom;

b. compounds of the formula:



wherein R has the meaning stated above and X represents a boron atom or a silicon atom; and

c. compounds of the formula:

wherein R has the meaning stated above.

3,907,747

REACTION PRODUCTS OF SILICON MONOXIDE AND CONJUGATED DIENES AND METHODS OF MAKING THE SAME

Erich T. Schaschel, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 16,235, March 3, 1970, abandoned. This application July 19, 1971, Ser. No. 164,029

Int. Cl.[2] C08G 77/04

U.S. Cl. 260—46.5 R 10 Claims

1. A method of preparing an organo silicon polymer comprising the steps of mixing about one mole of gaseous silicon monoxide with about 1.5 to 150 moles of a conjugated diene in a vacuum at a pressure of about 1×10^{-5} to 5×10^{-5} Torr to form a mixture, and condensing the mixture at a temperature of about −196° to −70°C. to provide the organo silicon polymer that is a reaction product of silicon monoxide and the conjugated diene.

3,907,748

PARACYCLOPHANE POLYMERS AND THE PRODUCTION THEREOF

Carl S. Marvel; Daniel Ting-Man Wong; Ira John Westerman; Celeste Samyn, all of Tucson, Ariz., and Parameswar Sivaramakrishnan, New Martinsville, W. Va., assignors to University Patents, Inc., Stamford, Conn.

Filed June 17, 1974, Ser. No. 479,983

Int. Cl.[2] C08G 75/23

U.S. Cl. 260—49 11 Claims

1. A linear paracyclophane polymer composed of bis(-phenoxybenzoyl)paracyclophane radicals and radicals selected from the group consisting of bis(phenoxybenzenesulfonyl)benzene and bis(phenoxybenzenesulfonyl)diphenyl ether, linked together with bivalent radicals selected from the group consisting of isophthaloyl and terephthaloyl radicals.

3,907,749

POLYOLEFINES WITH INCREASED STABILITY ON PROCESSING, AND WITH IMPROVED COLOUR

Hans-Helmut Friedrich, Lindenfels, Odenwald, Germany; Helmut Linhart, Reinach, Switzerland, and Hermann O. Wirth, Bensheim-Auerbach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 13, 1974, Ser. No. 469,273

Claims priority, application Germany, May 17, 1973, 2324922

Int. Cl.[2] C08F 45/60

U.S. Cl. 260—45.85 R 5 Claims

1. Polyolefins which contain 0.01 – 5% by weight, based on the polyolefin, of a compound or mixtures of the formula in which X denotes —O—, —S— or $—SO_2—$, Y denotes

or

n denotes the number 1 to 5, or *n* denotes a number between 1 and 8, and R denotes cycloalkyl with 5 to 6 carbon atoms, phenylalkyl with an alkyl radical of 1 to 2 carbon atoms, which can be substituted by methyl on the phenyl nucleus, with the phenylalkyl radical R being allowed to have a total of at most 8 carbon atoms, phenyl which can be substituted by halogen, methyl, ethyl, methoxy, ethoxy or methoxycarbonyl, with the substituted phenyl radical being allowed to have at most 8 carbon atoms, or, in the case that $n = 1$, alkyl with a total of 4 to 11 carbon atoms, which can be linear, or have short branch chains of at most 2 carbon atoms and/or can be unsaturated, or, in the case that $n = 1$ to 1.9, alkyl with 4 to 7 carbon atoms, which can be linear, branched and/or unsaturated, or in the case that $n = 2$ to 5 and $n = 2$ to 8, alkyl with 1 to 7 carbon atoms, which can be linear, branched and/or unsaturated, it also being possible, in all cases, for the alkyl chain to be interrupted by —O—, —S—, $—CO_2—$ or

and optionally, in addition to further additives, at most 1% by weight, relative to the polyolefin, of hydrophilic polymers.

3,907,750

REACTION PRODUCTS OF SILICON MONOXIDE AND OLEFINS AND METHODS OF MAKING THE SAME

Erich T. Schaschel, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 16,269, March 3, 1970, abandoned. This application July 19, 1971, Ser. No. 164,065

Int. Cl.[2] C08G 77/04

U.S. Cl. 260—46.5 R 16 Claims

1. An organo silicon polymer having a molecular chain with (—Si—O—Si—) units prepared by the reaction of one mole of silicon monoxide and about 5 to 60 moles of a mono-olefin, the polymer being the reaction product of a mixture of gaseous silicon monoxide and gaseous mono-olefin at a pressure of about 1×10^{-6} to 1×10^{-2} Torr and condensing the mixture at about −196° to −70°C., the gaseous silicon monoxide being formed by heating solid silicon monoxide to about 1200°–1300°C.

3,907,751

MOULDING COMPOSITION

Michael Horace Knight; Barbara Mitchell, and Maurice James Ratcliffe, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

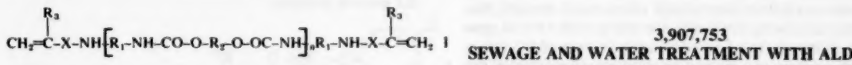
Filed Oct. 27, 1972, Ser. No. 301,331

Claims priority, application United Kingdom, Nov. 10, 1971, 52152/71

Int. Cl.[2] C08F *3/62, 3/84, 15/02, 35/06*

U.S. Cl. 260—47 UA 15 Claims

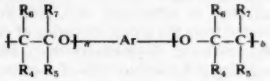
1. A moulding composition comprising a polymerisable vinyl-ended compound having the structure:



wherein:

R_1 is an aliphatic group, a cyclic aromatic or cycloaliphatic group or a group which includes in combination at least two of aliphatic, aromatic or cycloaliphatic groups;

R_2 is a divalent group having the structure:



where

R_4, R_5, R_6 and R_7 are each hydrogen atoms or alkyl groups, *a* and *b* are integers such that each is not greater than 9 and Ar is a divalent aromatic group in which each free valency is in an aromatic carbon atom;

R_3 is a hydrogen atom or an alkyl group;

X has the structure $-CO-O-(CR_2)_x-O-CO-$ where R is hydrogen or alkyl and where x is an integer and n is a whole number of from 1 to 20; provided that least one of R_1 and R_2 contains at least one cyclic group in the chain of the vinyl-ended compound and which are such that in said structure there are not more than 30 atoms in the chain between cyclic groups, and when *n* is one and only R_2 contains a cyclic group in the chain there are not more than 30 atoms in the chain between the cyclic group in R_2 and the nitrogen atom attached to the group X.

3,907,752

AROMATIC NITRILE AMIDE POLYMERS

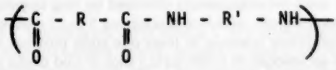
Lawrence W. Frost, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,597

Int. Cl.[2] C08G *69/32, 69/40*

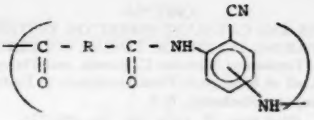
U.S. Cl. 260—47 CP 11 Claims

1. A nitrile amide polymer having the recurring structural unit



where R and R′ are divalent aromatic groups and where at least R′ contains at least one nitrile group as a substituent, at least one nitrile group in R′ being ortho to an amide group.

4. A nitrile amide polymer having the recurring structural unit



where R is a divalent aromatic group.

3,907,753

SEWAGE AND WATER TREATMENT WITH ALDEHYDE MODIFIED QUATERNARY SALTS OF VINYLPYRIDINE COPOLYMERS

Richard C. Doss, and James W. Cleary, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

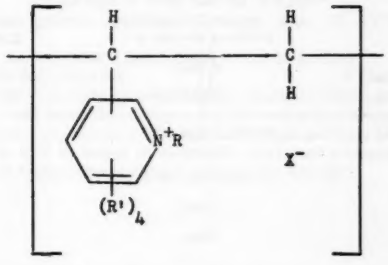
Division of Ser. No. 210,102, Dec. 20, 1971, Pat. No. 3,806,450. This application Jan. 21, 1974, Ser. No. 434,946

Int. Cl.[2] C08G *12/22, 12/26*

U.S. Cl. 260—67.5 7 Claims

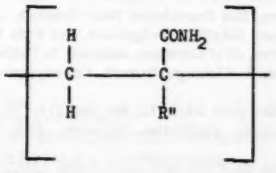
1. A composition comprising a water-soluble, normally solid reaction product of reactants consisting essentially of (A) an aldehyde containing from 1 to 7 carbon atoms and represented by the formula R‴CHO wherein R‴ is selected from the group consisting of hydrogen, and a monovalent saturated hydrocarbyl radical, and (B) a quaternary salt of a vinylpyridine-acrylamide copolymer consisting essentially of recurring units represented by the following formulas:

(I)



wherein each unit R independently represents the same or a different alkyl group having from 1 to 4 carbon atoms, each unit R′ independently is selected from hydrogen and alkyl groups having from 1 to 7 carbon atoms, the total number of carbon atoms in all of the R′ groups in each recurring unit being from 0 to 12, each unit X is selected from RSO_4, Cl and Br; and

(II)



wherein R″ is hydrogen or methyl; wherein said quaternary salt comprises from about 1 to about 50 weight percent of said formula (I) units, and wherein said aldehyde is employed in an amount in the range of about 2 to about 20 weight percent based on the amount of said quaternary salt.

3,907,754

PROCESS AND CATALYST-INHIBITOR SYSTEM FOR PREPARING SYNTHETIC LINEAR POLYESTER

Ronald A. Tershansy; Nicholas C. Russin, and Finley E. McFarlane, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 19, 1974, Ser. No. 480,776

Int. Cl.[2] C08G *63/04*

U.S. Cl. 260—75 R 6 Claims

1. Process of producing polyethylene terephthalate comprising reacting dimethyl terephthalate and ethylene glycol at a temperature sufficient to effect ester interchange and in the presence of a catalyst system comprising a mixture of salts of manganese and cobalt with acetyl triisopropyl titanate, the manganese salts being present in the amount of 35–110 ppm Mn, the cobalt salts being present in the amount of 5–35 ppm Co and the acetyl triisopropyl titanate being present in the amount of 36–72 ppm Ti, all parts by weight based on the acid fraction of the polyester.

3,907,755

SULFONATED POLYMERS DERIVED FROM L-LYSINE

Rodolphe Margraff, Ris-Orangis, and Guy Bourat, Bourg-la-Reine, both of France, assignors to Rhone-Poulenc S.A., Paris, France

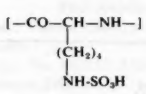
Filed Apr. 30, 1973, Ser. No. 355,407

Claims priority, application France, May 3, 1972, 72.015696

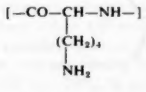
Int. Cl.[2] C08G *69/10*

U.S. Cl. 260—78 A 5 Claims

1. A modified L-lysine homopolymer consisting essentially of recurring units of the formula:



and recurring units of the formula:



the total number of recurring units of formula (I) being n and the total number of recurring units of formula (I) being m such that $n + m$ is greater than 5 with the proviso that m can be zero.

3,907,756

MANUFACTURE OF POLYMERIC PRODUCTS

Matthias Marx, Bad Duerkheim; Peter Dimroth, Ludwigshafen; Wolfgang Batzill, Ludwigshafen, and Felix Miksovsky, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 20, 1973, Ser. No. 371,775

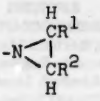
Claims priority, application Germany, June 23, 1972, 2230679

Int. Cl. C08f *3/64*, *3/70*; C08g *33/02*

U.S. Cl. 260—78.4 E 12 Claims

1. A process for the manufacture of polymeric products from mixtures of aziridine compounds and substances containing ester groups, wherein mixtures of

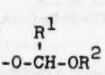
I. at least one compound containing, per molecule, at least two aziridine groupings of the general formula:



wherein

R^1 and R^2 are the same or different and are hydrogen or straight-chain or branched-chain alkyl of from 1 to 4 carbon atoms, and

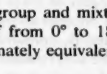
II. at least one compound containing an ester grouping of the general formula:



where

R^1 is straight-chain or branched-chain alkyl of from 1 to 4 carbon atoms and

R^2 is hydrogen, straight-chain or branched-chain alkyl, cycloalkyl, aryl or substituted aryl, said compound II being selected from the group consisting of di-(1-methyl-2-oxabutyl) maleate, di-(α-ethoxyethyl) adipate, polymers containing polymerized units of α-ethoxyethyl acrylate, α-ethoxy metharylate or butyl-α-ethoxyethyl maleate, and linear or branched polyester containing the radical



as a terminal or lateral group and mixtures thereof, are reacted at temperatures of from 0° to 180°C, said groupings being present in approximately equivalent amounts.

3,907,757

UNSATURATED POLYMERS CONTAINING REACTIVE GROUPS

Gottfried Pampus; Günther Lehnert, both of Leverkusen, and Josef Witte, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 14, 1972, Ser. No. 217,972

Claims priority, application Germany, Jan. 15, 1971, 2101684

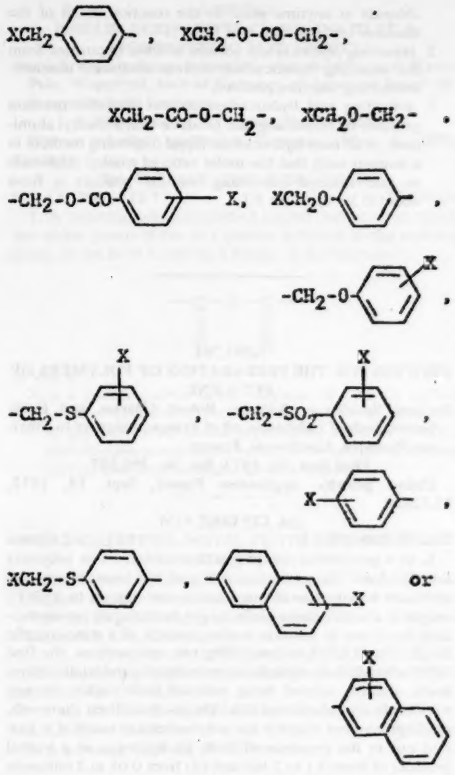
Int. Cl. C08f *27/02*, *27/06*, *27/08*

U.S. Cl. 260—79.3 R 5 Claims

1. A process for introducing reactive chlorine, bromine, iodine, cyanide, nitro or epoxy groups into a polymer containing —CH=CH-groups selected from the group consisting of polymers of conjugated dienes, said dienes having 4 to 8 carbon atoms, ethylene-propylene-diolefin-terpolymers and cis- and trans-polyalkenamers obtained by ring opening polymerization of cyclic mono-olefins having 5 to 12 carbon atoms which comprises reacting at least one such polymer with an olefin in an amount of 0.005 to 0.5 mol of said olefin per mol of double bonds in the main chain of said polymer of 0.01 to 1 mol of said olefin per mol of double bonds in the side chains of said polymer, said olefin being of the formula

$$R - CH = CH - R$$

wherein R is hydrogen, alkyl having 1 to 6 carbon atoms, cycloalkyl having 5 to 7 carbon atoms,



wherein X is chlorine, bromine, iodine, cyanide, nitro or

and wherein at least one R is not hydrogen and is substituted by chlorine, bromine, iodine, cyanide, nitro or

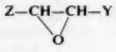
and said reaction being carried out in the presence of an organometallic mixed catalyst of

a. a halide of a metal of Group Vb or VIb of the Periodic System,

b. an organometallic compound of Groups Ia and IV of the Periodic System and

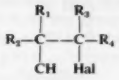
c. a cocatalyst selected from the group consisting of

1. a compound of the formula



wherein Z is hydrogen, alkyl having 1 to 6 carbon atoms, aryl having 6 to 20 carbon atoms, aralkyl having 6 to 20 carbon atoms in the aryl moiety and 1 to 6 carbon atoms in the alkyl moiety or said aryl or aralkyl substituted with methyl or chlorine and Y is hydrogen, alkyl having 1 to 6 carbon atoms, aryl having 6 to 20 carbon atoms, aralkyl having 6 to 20 carbon atoms in the aryl moiety and 1 to 6 carbon atoms in the alkyl moiety, $-CH_2-Hal$ wherein Hal is fluorine, chlorine, bromine or iodine or said aryl or aralkyl substituted with methyl or chlorine and

2. a compound of the formula



wherein Hal is fluorine, chlorine, bromine or iodine, R_1 and R_2 which may be the same or different are hydrogen, alkyl having 1 to 6 carbon atoms, aryl having 6 to 20 carbon atoms or aralkyl having 6 to 20 carbon atoms in the aryl moiety and 1 to 6 carbon atoms in the alkyl moiety and R_3 and R_4, which may be the same or different, are fluorine, chlorine, bromine, iodine, hydrogen, alkyl having 1 to 6 carbon atoms, aryl having 6 to 20 carbon atoms or aralkyl having 6 to 20 carbon atoms in the aryl moiety and 1 to 6 carbon atoms in the alkyl moiety and R_1 and R_3, when taken together with the carbon atoms to which they are attached, form a 5- to 8-membered carbocyclic ring, the molar ratio of (a):(b):(c) being 1:0.5 to 15:0.3 to 10.

3,907,758

ADDITIVES FOR PAPER

Gunter Sackmann, Opladen; Gunter Kolb, Leverkusen, and Friedhelm Muller, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 9, 1974, Ser. No. 504,558

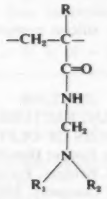
Claims priority, application Germany, Sept. 12, 1973, 2345922

Int. Cl.² C08F *220/00;* **C08G** *75/00;* **D21D** *3/00*

U.S. Cl. 260—79.3 MU **1 Claim**

1. Additives useful for increasing the retention of fibers and fillers in the production of paper or in the treatment of sewage comprising copolymers consisting essentially of

85 to 95% by weight of statistically distributed polymeric units of Mannich bases corresponding to the formula:



wherein

R is hydrogen or methyl;

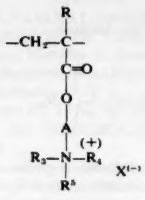
R_1 is hydroxyalkyl having 2 to 3 carbon atoms;

R_2 is alkyl having 1 to 2 carbon atoms;

R_1 and R_2 are each hydroxyalkyl having 2 to 3 carbon atoms;

R_1 and R_2 together with the nitrogen atom to which they are attached are pyrrolidino, morpholino, N-methylpiperazino or N-ethylpiperazino and

15 to 5% by weight of statistically distributed polymeric units of the fomula:



wherein

R is hydrogen or methyl;

A is alkylene having 2 to 4 carbon atoms;

R_3 is hydrogen or alkyl having 1 to 4 carbon atoms;

R_4 and R_5 are alkyl having 1 to 4 carbon atoms $X^{(-)}$ is a negative group capable of salt formation with the amine nitrogen selected from the group consisting of halide, acetate, methosulphate and tolylsulphate.

3,907,759

CATALYST FOR POLYMERIZATION OF OLEFINS AND PROCESS FOR POLYMERIZATION OF OLEFINS WITH USE OF SAID CATALYST

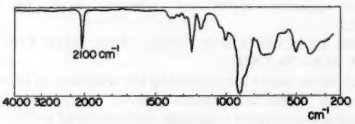
Naotake Okada; Kazumi Tsubaki; Hiroshi Morinaga; Takeshi Iwabuchi; Masaru Iida, all of Ichihara, and Koichi Taguchi, Kuki, all of Japan, assignors to Nissan Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1973, Ser. No. 403,223

Claims priority, application Japan, Oct. 6, 1972, 47-100465; Apr. 25, 1973, 48-46954

Int. Cl.² C08F *4/02, 10/02, 10/04*

U.S. Cl. 260—88.2 **15 Claims**



1. A catalyst for polymerization of olefins which comprises an organic metal compound and a solid catalyst component obtained by reacting a transition metal halogen compound with a reaction product between an organic silicon compound selected from the group consisting of chain hydropolysiloxanes, cyclic hydropolysiloxanes and organic and hydroxyl groups bearing organic silicon compounds and a Grignard reagent.

3,907,760

PROCESS FOR MANUFACTURE OF HIGH BULK DENSITY POWDERS OF OLEFIN POLYMERS

Gordon Y. T. Liu, Baton Rouge; Donald R. Smith, East Baton Rouge, and Robert D. Bridges, Parish, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 16, 1971, Ser. No. 115,881

Int. Cl.² C08F *4/16, 10/02, 10/04*

U.S. Cl. 260—88.2 R **10 Claims**

1. A process for producing a high bulk density powder of a normally solid, linear olefin polymer which comprises polymerizing monomeric material of at least one alpha-monoolefin in a polymerization zone under pressure in the range of from about 5 to about 30 atmospheres at slurry polymerization temperature in an inert liquid hydrocarbon dispersing medium in the presence of a catalyst prepared by

1. reacting titanium tetrachloride dissolved in an inert hydrocarbon solvent with diethyl aluminum chloride dissolved in an organic solvent by combining the reactants with thorough stirring in a manner such that the molar ratio of titanium tetrachloride to diethyl aluminum monochloride at anytime prior to the reaction of all of the titanium tetrachloride is at least 1;
2. removing hydrocarbon solvent soluble impurities from the resulting hydrocarbon solvent-insoluble, titanium-containing reaction product;
3. activating said hydrocarbon solvent-insoluble reaction produce by combining said produce with a trialkyl aluminum, in an inert hydrocarbon liquid dispersing medium in a manner such that the molar ratio of trialkyl aluminum to said titanium-containing reaction product is from about 0.3:1 to about 3:1.

3,907,761

PROCESS FOR THE PREPARATION OF POLYMERS OF BUT-1-ENE

Bernard Boucheron, Bethune; Robert Charles, and Emile Gosset, both of Lillebonne, all of France, assignors to Ethylene Plastique, Courbevoie, France

Filed Sept. 10, 1973, Ser. No. 395,857

Claims priority, application France, Sept. 14, 1972, 72.32650

Int. Cl.² C08F *4/16*

U.S. Cl. 260—88.2 R **2 Claims**

1. In a process for the preparation of but-1-ene polymers selected from the group consisting of but-1-ene homopolymers and copolymers of but-1-ene containing up to 15% by weight of another alpha-olefin by polymerizing or copolymerizing but-1-ene in solution in the presence of a stero-specific Ziegler-Natta catalyst comprising two components, the first being selected from dialkylaluminum halides and trialkylaluminum, and the second being selected from violet titanium trichloride and aluminum chloride co-crystallized therewith, the improvement wherein the polymerization reaction is carried out in the presence of both (i) hydrogen at a partial pressure of from 0.1 to 1 bar and (ii) from 0.05 to 2 millimols of an additive selected from hydrazine and 1,1-dimethylhydrazine per litre of reaction mixture.

3,907,762

ANGIOTENSIN II POSITION 8 ANALOGS

Domenico C. Regoli, Magog, and Won Kil Park, Sherbrooke, both of Canada, assignors to University of Sherbrooke, Quebec, Canada

Filed Dec. 27, 1971, Ser. No. 212,257

Int. Cl.² C07C *103/52;* **A61K** *37/26*

U.S. Cl. 260—112.5 **3 Claims**

1. As new derivatives of Angiotensin$_{II}$ the L epimers corresponding to the general formula:

1	2	3	4	5	6	7	8
Asp -	Arg -	Val -	Tyr -	Ile -	His -	Pro -	R

wherein

Asp is aspartyl

Arg is arginyl

Val is valyl

Tyr is tyrosyl

Ile is isoleucyl

His is histidyl

Pro is prolyl, and

R is a radical selected from the group consisting of, valine and α-amino butyric acid.

3,907,763

INSULIN DERIVATIVES CROSSLINKED BY A DICARBOXYLIC ACID MOIETY

Dietrich Brandenburg, Schmithof, uber Aachen, and Walter Puls, Wuppertal, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

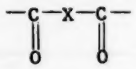
Filed Feb. 16, 1973, Ser. No. 333,361

Claims priority, application Germany, Mar. 1, 1972, 2209835

Int. Cl.[2] A61K *37/26*; C07C *103/52*

U.S. Cl. 260—112.7 27 Claims

1. A bifunctionally crosslinked insulin derivative in which the amino group of the A-1 glycine is linked to the ϵ-amino group of the B-29 lysine by a bridge of the formula:



in which

X is a carbon-carbon bond, alkylene of 1 to 15 carbon atoms or alkylene of 1 to 15 carbon atoms in which two of said carbon atoms are replaced by sulfur or wherein said alkylene is substituted at one or two of the remaining carbon atoms by an amino or amido group.

3,907,764

PEPSINOSTREPINS, NOVEL PROTEASE INHIBITORS FROM STREPTOMYCES

Atsushi Kakinuma, Kyoto; Tsuneo Kanamaru, Tokyo; Hiromu Sugino, Osaka; Tsuneo Asano, Kawanishi, and Masahiko Yoneda, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

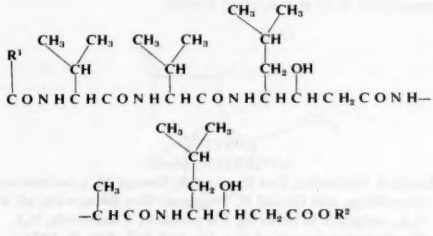
Filed Apr. 9, 1973, Ser. No. 349,129

Claims priority, application Japan, Apr. 7, 1972, 47-35375; July 7, 1972, 47-68415

Int. Cl.[2] C07C *103/52*; C12B *1/00*; A61K *37/26*

U.S. Cl. 260—112.5 4 Claims

1. A protease inhibitor of the formula



wherein R^1 is ethyl or isopropyl and R^2 is a hydrogen atom or methyl, and wherein the optical rotation of the protease inhibitor in methanol at 25°C is from about −85° to about −95°.

3,907,765

PROCESS FOR PREPARING OCTAPEPTIDE INTERMEDIATE FOR HUMAN INSULIN AND INTERMEDIATES

Su-Sun Wang, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 29, 1973, Ser. No. 375,200

Int. Cl.[2] C07C *103/52*; A61K *37/26*

U.S. Cl. 260—112.5 8 Claims

3. An improved process for the preparation of the tripeptide Z—Gly—Phe—Phe without racemization of the reactants or intermediates which process comprises:

A. reacting phenylalanine with Boc—Phe—OSu in a polar, non-protic solvent in the presence of an organic base so as to product Boc—Phe—Phe;

B. treating the said Boc—Phe—Phe produced in step A. above with trifluoroacetic acid to remove the Boc protecting group; and,

C. reacting the resulting free dipeptide with a protected glycine selected from the group consisting of Z—Gly—OSu and Z—Gly—ONP in a polar, non-protic solvent in the presence of a tri-C_{1-7} lower alkylamine to produce the desired Z—Gly—Phe—Phe.

3,907,766

L-ASPARTYL-AMINOMALONIC ACID DIESTER

Masahiko Fujino, Takarazuka; Mitsuhiro Wakimasu, Suita; Nobuo Nakajima, Nishinomiya, and Hisashi Aoki, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

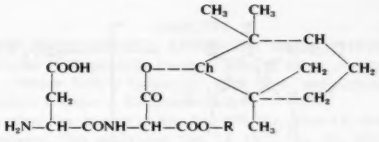
Filed July 6, 1973, Ser. No. 377,138

Claims priority, application Japan, July 17, 1972, 47-71464; July 19, 1972, 47-72954

Int. Cl.[2] C07C *103/52*; A23L *1/22*

U.S. Cl. 260—112.5 1 Claim

1. A compound selected from the group consisting of compounds of the formula



wherein R is methyl or ethyl, and physiologically acceptable salts thereof.

3,907,767

1-PHENYL-3-HYDROXY-3-METHYL-TRIAZENES

Friedrich Karl Hess, Hudson; Patrick Bryan Stewart, St. Andrews East; Genus Possanza, Dorval, and Kurt Freter, Beaconsfield, all of Canada, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

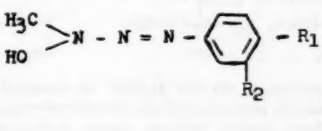
Filed Jan. 12, 1973, Ser. No. 323,071

Claims priority, application Germany, Feb. 23, 1972, 2208368

Int. Cl.[2] A61K *31/655*; C07C *115/00*

U.S. Cl. 260—140 5 Claims

1. A compound of the formula



wherein

R_1 is carbamoyl, N-lower alkyl-carbamoyl, lower alkoxycarbonyl or cyano, and

R_2 is hydrogen or methyl.

3,907,768

LIQUID CRYSTALLINE AZOXYBENZENE COMPOUNDS

Jan van der Veen, and Adrianus Hendrikus Grobben, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

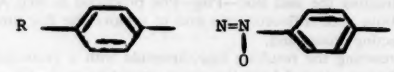
Filed Mar. 31, 1972, Ser. No. 240,171

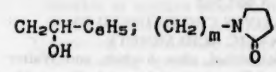
Claims priority, application Netherlands, Apr. 3, 1971, 7104498

Int. Cl.[2] C07C *105/00*

U.S. Cl. 260—143 9 Claims

1. A member selected from the group consisting of a compound of the formula





where R and R′ each represent a normal alkyl group containing from 4 to 10 carbon atoms and mixtures thereof.

3,907,769

AZO COMPOUNDS CONTAINING A 2,6-DIAMINOPYRIDINE COUPLER COMPONENT

Johannes Dehnert, and Gunther Lamm, both of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

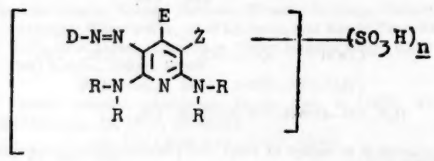
Filed Mar. 28, 1973, Ser. No. 345,507

Claims priority, application Germany, Apr. 16, 1972, 2216570; Feb. 22, 1973, 2308663

Int. Cl.[2] C09B *29/36, 31/14;* **D06P** *1/38, 1/39*

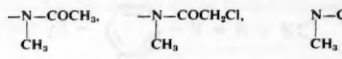
U.S. Cl. 260—156 **8 Claims**

1. A water-soluble acid dye which in the form of the free acid has the formula



in which:

D is phenyl substituted by fluoro, chloro, bromo, methyl, ethyl, trifluoromethyl, methoxy, ethoxy, alkanoylamino, said alkanoyl having 1 to 4 carbon atoms, hydroxyacetylamino, benzoylamino, chlorobenzoylamino, phenacetylamino, cyano, nitro, methylsulfonyl, ethylsulfonyl, phenylsulfonyl, acetyl, benzoyl, carboxyl, alkoxycarbonyl or alkoxyethoxycarbonyl, said alkoxy having 1 to 4 carbon atoms, carbamoyl, sulfamoyl, carbamoyl or sulfamoyl substituted at the nitrogen once or twice by alkyl of 1 to 8 carbon atoms, phenyl, β-hydroxyethyl, γ-hydroxypropyl, β-methoxyethyl or γ-methoxypropyl; carbopyrrolidide, carbopiperidide, carbomorpholide, sulfopyrrolidide, sulfopiperidide, sulfomorpholide,



hydroxylsulfonyl, $SO_2NHC_2H_4SO_3H$ or 6-methyl-7-sulfo-2-benzthiazolyl; phenylazophenyl; phenylazophenyl substituted by hydroxy, methyl, methoxy, ethoxy, hydroxysulfonyl or $SO_2NHC_2H_4SO_3H$; 3- or 4-phthalimidyl; or 3- or 4-phthalimidyl substituted at the nitrogen by alkyl of 1 to 8 carbon atoms, β-hydroxyethyl, β-methoxyethyl, γ-hydroxypropyl, γ-methoxypropyl, β-hydroxyethoxyethyl, benzyl, phenylethyl, sulfobenzyl, sulfophenylethyl, phenyl or phenyl substituted by methyl or hydroxysulfonyl;

n is one of the integers 1, 2 and 3;

E is hydrogen, alkyl of 1 to 7 carbon atoms, phenyl or methylphenyl,

Z is cyano or carbamoyl,

R is hydrogen; alkyl of 1 to 8 carbon atoms; alkyl of 2 to 8 carbon atoms substituted by hydroxy, alkoxy of 1 to 4 carbon atoms, cyclohexoxy, benzyloxy, phenoxy or cyano; cyclohexyl; methylcyclohexyl; norbornyl, benzyl; sulfobenzyl; phenylethyl; sulfophenylethyl; phenylpropyl; sulfophenylpropyl; phenyl, phenyl substituted by methyl, methoxy, ethoxy, chloro or hydroxysulfonyl; sulfoethyl; $C_2H_4OC_2H_4OH$; $(CH_2)_3OC_2H_4OR^1$; $(CH_2)_3O(CH_2)_4OH$;

m is 2, 3, 4 or 6,

R when taken in pairs together with the attached nitrogen to form a heterocyclic ring represents pyrrolidino, piperidino or morpholino; and

R^1 is alkyl of 1 to 4 carbon atoms, benzyl or phenyl, with the proviso that *n* SO_3H-groups are present only in the radicals D and R and *n* represents the total number of said SO_3H-groups in the compound.

3,907,770

PROCESS OF EXTRACTING CARRAGEENAN FROM SEAWEED

Clifford H. G. Strong, Guelph, Canada, assignor to Uniroyal Ltd., Montreal, Canada

Filed May 18, 1973, Ser. No. 361,703

Claims priority, application Canada, Feb. 5, 1973, 162894

Int. Cl.[2] C07H *3/00;* **C08B** *37/00*

U.S. Cl. 260—209 R **16 Claims**

1. A process of obtaining carrageenan from seaweed of the Class Rhodophyceae which comprises digesting at a temperature of from 90° to 160°C a mixture of the seaweed with water and an alkaline material selected from the group consisting of alkaline earth metal hydroxides and alkali metal hydroxides, the seaweed content, on a dry basis, of said mixture being equal to at least about 9 percent by weight and the amount of said alkaline material being equal to at least about 5 percent by weight of the initial dry weight of seaweed in said mixture, and thereby causing carrageenan from said seaweed to dissolve in the aqueous phase of the digested mixture, separating carrageenan from the digested mixture.

3,907,771

ANTIBIOTIC 66-40

Marvin J. Weinstein, East Brunswick; George M. Luedemann, Glen Ridge, and Gerald H. Wagman, East Brunswick, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 112,368, Feb. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 797,304, Dec. 16, 1968, abandoned, which is a continuation-n-part of Ser. No. 740,742, June 27, 1968, abandoned. This application June 25, 1973, Ser. No. 373,064

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 AB **8 Claims**

1. A member selected from the group consisting of sisomicin, non-toxic acid addition salts, including solvates thereof, and condensation products of sisomicin with aldehydes having up to 12 carbon atoms; said sisomicin being a solid composition of matter having:

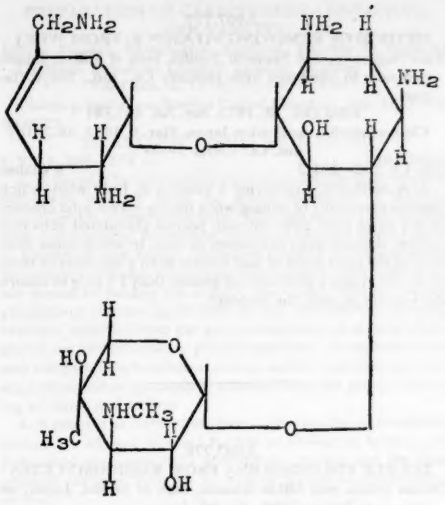
a. a molecular weight of 447.26 as determined by mass spectrometry;

b. the empirical formula $C_{19}H_{37}N_5O_7$;

c. a specific optical rotation as measured by the D line of sodium at 26° of +188.9° in water at 0.3% concentration;

d. an infrared absorption spectrum in mineral oil substantially as shown in FIG. 1; and

e. a nuclear magnetic spectrum in deuterium oxide as shown in FIG. 2; said sisomicin having the following formula:



3,907,772

PROCESS FOR PREPARING LOGANIN AND ANALOGS THEREOF

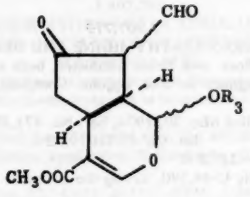
John Joseph Partridge, Jr., Montclair, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 845, Jan. 5, 1970, Pat. No. 3,755,118. This application June 1, 1973, Ser. No. 365,937

Int. Cl.[2] C07H *17/02*

U.S. Cl. 260—210 R 4 Claims

1. A compound of the formula



wherein R_3 is selected from the group consisting of lower alkyl, ar-lower alkyl, glucopyranosyl and tetraacetylglucopyranosyl.

3,907,773

NOVEL Δ^4/Δ^5-DEHYDROCARDENOLIDES AND PROCESS FOR THEIR PREPARATION

Johannes Hartenstein, Wittental; Gerhard Satzinger, Im Mattenbuhl, and Manfred Herrmann, Gundelfingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

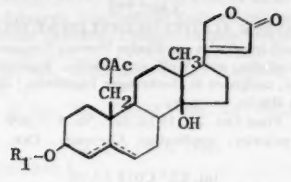
Filed June 5, 1973, Ser. No. 367,258

Claims priority, application Germany, June 5, 1972, 2227223

Int. Cl.[2] C07J *19/00*

U.S. Cl. 260—210.5 24 Claims

1. A compound of formula I:



wherein R_1 represents a member of the group consisting of a rhamnose-cymarose- or digitoxose radical which may be substituted by methyl, lower alkylidene, cyclohexylidene, lower alkanoyl and lower alkoxy-alkanoyl and Ac represents a member of the group consisting of an unsubstituted alkanoyl radical of 3 to 5 carbon atoms and an alkanoyl radical of 2 to 3 carbon atoms substituted by chloro or methoxy radicals.

3,907,774

CELESTOSAMINIDE ANTIBIOTIC DERIVATIVES

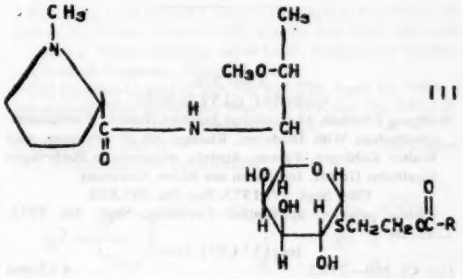
Alexander D. Argoudelis, Portage; John H. Coats, and LeRoy E. Johnson, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 370,351, June 15, 1973, abandoned. This application Oct. 25, 1973, Ser. No. 409,402

Int. Cl.[2] C07H *15/16*

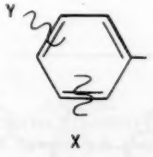
U.S. Cl. 260—210 R 16 Claims

1. A compound having the structural formula



III

wherein R is



X

wherein X and Y are selected from the group consisting of H, R′, —OH, —OCH_3, OR′, —NH_2, NHR′, NO, NO_2, —CHO, —CN, —COOH, —CH_2OH, —SO_3H, —SO_2NH_2, Cl, Br, I, F, —SH, and SR′, R′ is alkyl of not more than 8 carbon atoms, with the understanding that X and Y can be the same or different except that when X is H, Y cannot be —OH in the ortho position, and pharmaceutically acceptable acid addition salts thereof.

3,907,775

15',16'-LOWER ALKOXYMETHYLIDENE-DIGITOXINS

Walter Lösel, Ingelheim am Rhein; Werner Traunecker, Munster-Sarmsheim, and Wolfgang Hoefke, Budenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

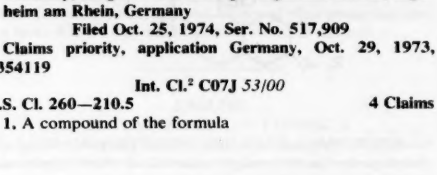
Filed Oct. 25, 1974, Ser. No. 517,909

Claims priority, application Germany, Oct. 29, 1973, 2354119

Int. Cl.² C07J *53/00*

U.S. Cl. 260—210.5 4 Claims

1. A compound of the formula



wherein R is n-alkyl of 1 to 4 carbon atoms.

3,907,776

CARDIAC GLYCOSIDES

Wolfgang Eberlein, Mettenberg; Joachim Heider, Warthausen-Oberhofen; Willi Diederen, Rissegg, all of Germany, and Walter Kobinger, Vienna, Austria, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

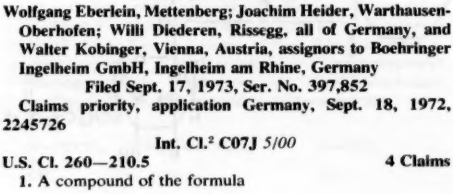
Filed Sept. 17, 1973, Ser. No. 397,852

Claims priority, application Germany, Sept. 18, 1972, 2245726

Int. Cl.² C07J *5/00*

U.S. Cl. 260—210.5 4 Claims

1. A compound of the formula



wherein R is cyano or carbalkoxy of 2 to 4 carbon atoms.

3,907,777

METHOD OF REMOVING VITAMIN B_2 FROM WHEY

Taro Nagasawa, and Mamoru Tomita, both of Tokyo, Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1973, Ser. No. 407,581

Claims priority, application Japan, Mar. 9, 1973, 48-27167

Int. Cl.² C07H *19/06*

U.S. Cl. 260—211.3 8 Claims

1. A method for removing a vitaimn B_2 from whey which consists essentially of eluting whey having a total solid content of not more than 25%, through porous granulated activated carbon, derived from petroleum or coal, in which more than 55% of the total pores of said carbon have a diameter of from 40 to 200 A and a pore volume greater than 1.1 cc/g to adsorb the vitamin B_2 onto the carbon.

3,907,778

DOUBLE STRANDED RNA FROM BASIDIOMYCETES

Nakao Ishida, and Mikio Kikuchi, both of Sendai, Japan, assignors to Nakao Ishida, Sendai, Japan

Filed May 15, 1970, Ser. No. 37,698

Claims priority, application Japan, May 26, 1969, 44-40404

Int. Cl.² C07H *21/02*

U.S. Cl. 260—211.5 R 7 Claims

1. A method for preparing crude material of viral infection inhibitory substance inducer, which comprises extracting crude material, which induces the viral infection inhibitory substance and is composed mainly of double stranded RNA, out of the spore or mycelium of basidiomycetes.

3,907,779

5,6 DIHYDRO-5-AZATHYMIDINE AND DERIVATIVES

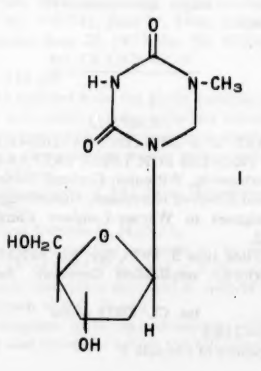
Clarence DeBoer, and Brian Bannister, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 20, 1974, Ser. No. 471,322

Int. Cl.² C07H *19/12*

U.S. Cl. 260—211.5 R 3 Claims

1. Antibiotic U-44,590, having the structure



3,907,780

PREPARATION OF CARBODIIMIDE-CONTAINING ISOCYANATES

Jeffrey Hughes, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 2, 1974, Ser. No. 429,807

Claims priority, application United Kingdom, Jan. 15, 1973, 2035/73

Int. Cl.[2] C07C *119/055*; C07D *229/00*

U.S. Cl. 260—239 A 10 Claims

1. A process for converting isocyanate groups in an organic isocyanate selected from the group consisting of tolylene diisocyanates, diphenylmethane diisocyanates and polyisocyanate compositions comprising diphenylmethane diisocyanate in admixture with higher methylene bridged polyphenyl polyisocyanates of higher isocyanate functionality, into carbodiimide groups by heating the organic isocyanate with an organic phosphorus containing catalyst for the carbodiimide-forming reaction, selected from the group consisting of organic phosphates or phosphonates, phosphoramides, phosphonamides and triarylamidophosphates, and an active hydrogen containing compound as co-catalyst, selected from the group consisting of water and aniline.

4. A process as claimed in claim 1 wherein the carbodiimide groups are allowed to react further to convert at least a proportion of such groups to uretonimine groups and the final product contains from 3% to 10% by weight of uretonimine groups.

3,907,781

PROCESS FOR RECOVERY OF ε-CAPROLACTAM FROM A REACTION MIXTURE OF ε-CAPROLACTAM AND SULPHURIC ACID

Abraham H. De Rooij, Geleen, and Jan Elmendorp, Brunssum, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed June 24, 1974, Ser. No. 482,601

Claims priority, application Netherlands, June 26, 1973, 7308834

Int. Cl.[2] C07D *201/18*; C01C *1/242*

U.S. Cl. 260—239.3 A 2 Claims

1. A continuous process for the recovery of ε-caprolactam from a synthesis reaction mixture composed of the lactam and sulfuric acid by concurrently neutralizing and crystallizing the synthesis reaction mixture, comprising the steps of neutralizing the synthesis reaction mixture with ammonia in a circulating volume of ammonium sulfate solution at a pressure of 1–5 atmospheres in a neutralization zone, the neutralization simultaneously forming additional ammonium sulfate crystals and liberating heat; passing the crystal-rich neutralized mixture to a boiling area and causing the mixture to boil and water vapor to be discharged from the mixture; separating the neutralized solution into a supernatent layer lactam-rich aqueous solution and a suspension of ammonium sulphate crystals in ammonium sulphate solution; recovering the lactam-rich layer; separating the ammonium sulphate crystals from the suspension; recycling the separated mother liquor to the neutralization zone, whereby the heat generated by the neutralization reaction is discharged out of the system by evaporation of a portion of the water of the recirculating mixture.

3,907,782

FUMARAMIDO BIS(PYRIDINIUM SALTS)

Philip Neil Edwards, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 27, 1973, Ser. No. 428,693

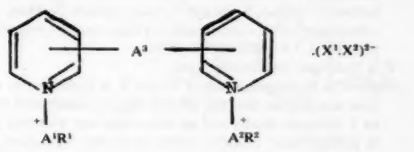
Claims priority, application United Kingdom, Mar. 29, 1971, 8071/71

Division of Ser. No. 234,648, Mar. 14, 1972, Pat. No. 3,786,058

Int. Cl.[2] C07D *31/44*

U.S. Cl. 260—240 J 4 Claims

1. A pyridine derivative of the formula:



wherein R^1 and R^2 which may be the same or different are each alkyl having 8 to 14 carbon atoms, n-undec-10-yl, 2-n-hexyloxyethyl, 2-(2-butoxyethoxy)-ethyl, 3,4-dichlorphenyl, 4-chlorobenzyl, 2,4-dichlorobenzyl or 2-naphthylmethyl; A^1 and A^2 are each a direct linkage or a linking group of the formula $—CH_2CO.NH—$ wherein the methylene is joined to the pyridine nitrogen; $(X^1.X^2)^{2-}$ represents two monoanions or a dianion selected from the group consisting of two halide, methanesulphonate, toluene-p-sulphonate or acetate ions or the sulphate dianion; and A^3 is a linking group of the formula: —NH.COCH=CHCO.NH—.

3,907,783

CERTAIN GERANYL PHENYL ETHERS AND THEIR EPOXIDES AND THEIR USE IN CONTROLLING INSECTS

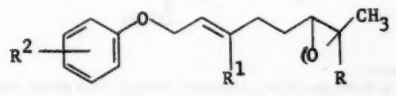
Ferenc M. Pallos, Pleasant Hill; Hwalin Lee, Palo Alto, and Julius J. Menn, Saratoga, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 815,229, April 10, 1969, abandoned. This application Sept. 8, 1969, Ser. No. 856,140

Int. Cl.[2] C07D *303/28*

U.S. Cl. 260—240 H 20 Claims

1. A compound of the formula:



in which R and R^1 are independently methyl or ethyl; R^2 is hydrogen; halogene; lower alkyl having 1 to 6 carbon atoms; lower alkoxy having 1 to 4 carbon atoms; lower alkenyl having 2 to 6 carbon atoms; lower alkylthio having 1 to 5 carbon atoms; or nitro.

3,907,784

7-HALOPHENYLTHIOACETAMIDO CEPHALOSPORINS

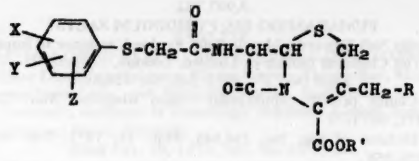
George W. Huffman, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 288,227, Sept. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,739, Dec. 27, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,210

Int. Cl.[2] C07D *501/20*

U.S. Cl. 260—243 C 12 Claims

1. A cephalosporin antibiotic compound of the formula



in which

R' is hydrogen, dicyclohexylamine, or a pharmaceutically acceptable cation;

R is selected from the group consisting of 5-methyl-1,3,4-thiadiazol-2-ylthio, 1-methyl-1H-tetrazol-5-ylthio, 1H-tetrazol-5-ylthio, 5-phenyl-1,3,4-oxadiazol-2-ylthio, 5-(p-nitrophenyl)-1,3,4-oxadiazol-2-ylthio, and 5-(p-methoxyphenyl)-1,3,4-oxadiazol-2-ylthio;

Z is hydrogen or fluorine; and,

when Z is hydrogen, each of X and Y is hydrogen or chlorine selected so that the phenyl ring is substituted with 1 or 2 chlorine atoms and so that when one chlorine atom is present said chlorine atom is in the 3-position, and when two chlorine atoms are present said chlorine atoms are in the 3,4-, the 3,5-, or the 2,5-positions; and,

when Z is fluorine, said fluorine is in the 3- or 4-position of the phenyl ring, and each of X and Y is hydrogen or chlorine selected so that when the phenyl ring is substituted with 1 or 2 chlorine atoms, one of the chlorine atoms is in the 3- or 4-position of the phenyl rings.

3,907,785

TRICYCLIC CEPHALOSPORINS

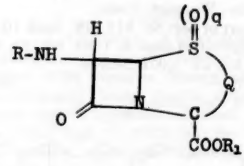
Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 17, 1973, Ser. No. 380,012

Int. Cl.[2] C07D *501/20*

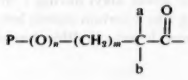
U.S. Cl. 260—243 C **16 Claims**

1. A compound of the formula



wherein

R is hydrogen, C_1–C_8 alkanoyl, benzoyl, or a group represented by the formula:



wherein

P is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, phenyl or phenyl substituted by amino, protected amino, C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy, halogen, hydroxy, or protected hydroxy;

a is hydrogen or C_1–C_3 alkyl;

b is hydrogen or C_1–C_3 alkyl, amino, protected amino, hydroxy or protected hydroxy;

m is 0 or an integer from 1 to 3;

n is 0 or 1;

subject to the limitation that when *n* is 1,

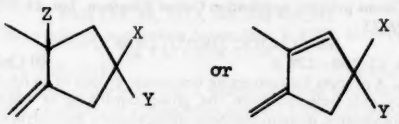
P is phenyl or phenyl substituted by amino, protected amino, C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy, halogen, hydroxy, or protected hydroxy; and

b is hydrogen or C_1–C_3 alkyl;

R_1 is hydrogen, a carboxylic acid protecting group, or an alkali metal or alkaline earth metal cation;

q is 0 or 1;

Q is

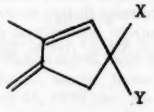


wherein

X and Y are independently acetyl, benzoyl, carbethoxy, carbomethoxy, carboxy, cyano or 2,2,2-trichloroethoxycarbonyl; and

Z is hydrogen or bromine;

subject to the limitations that when Z is bromine, *q* is 1 and X and Y are other than carboxy or cyano; and subject to the further limitation that *q* is 0 when Q is



3,907,786

7-[α-(2-AMINOMETHYL-1,4-CYCLOHEXADIENYL-)ACETAMIDO]-3-HETEROCYCLIC-THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS AND SALTS

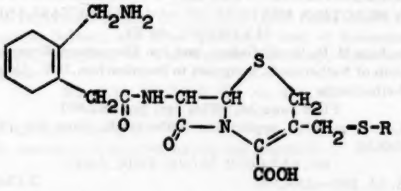
Takayuki Naito, Tokyo; Jun Okumura, Yokohama, and Hideaki Hoshi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,367

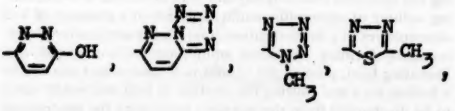
Int. Cl. C07d *99/24*

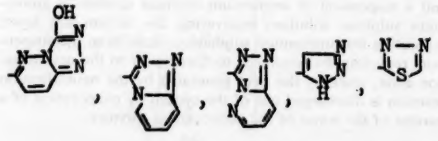
U.S. Cl. 260—243 C **51 Claims**

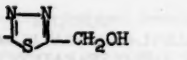
1. An acid having the formula



wherein R is







or a nontoxic, pharmaceutically acceptable salt thereof.

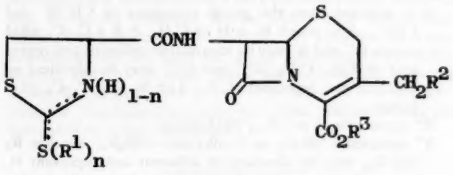
3,907,787

7-(2-THIOXO-4-THIAZOLIDINECARBOXAMIDO)CEPHALOSPORANIC ACIDS AND THE CORRESPONDING S-ETHERS

Daniel M. Teller, Devon, and John H. Sellstedt, Pottstown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,944
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C 3 Claims

1. A compound of the formula:



in which

R^1 is hydrogen or alkyl of 1 to 4 carbon atoms;

R^2 is hydrogen, acetoxy or N-pyridinium

R^3 is hydrogen, an alkali metal or the ammonium ion; and

n is 0 or 1.

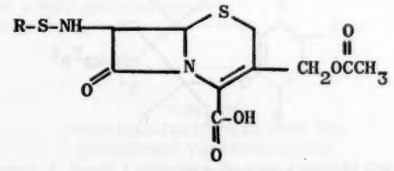
3,907,788

SULFENYL DERIVATIVES OF 7-AMINOCEPHALOSPORANIC ACID

Abraham Nudelman, Rehovot, Israel, assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,414
Int. Cl.² C07D *501/18*
U.S. Cl. 260—243 C 4 Claims

1. A compound of the formula:



wherein R is lower alkyl, trihalomethyl, benzyl, phenethyl, or a benzyl or phenethyl group in which the benzene ring thereof is substituted with a nitro, halogen, cyano, or lower alkyl group, and the alkali metal, alkali earth metal, or ammonia salts thereof.

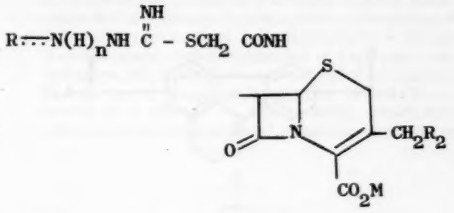
3,907,789

7-[2-(N-AMINO AMIDINOTHIO)ACETAMIDO]CEPHALOSPORANIC ACIDS

Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,088
Int. Cl.² C07D *501/28, 501/22, 501/40*; A61K *31/545*
U.S. Cl. 260—243 C 7 Claims

1. A compound of the formula:



in which

R is a member selected from the group consisting of —H, alkanoyl of 2 to 6 carbon atoms or phenyl, when *n* is 1, and alkylidene of 3 to 6 carbon atoms or pyridylmethylene, when n is zero;

R^2 is a member selected from the group consisting of —H, alkanoyloxy of 2 to 6 carbon atoms and, when taken with the 3-carboxy group,

;

M is a member selected from the group consisting of —H, an alkali metal and $—NH_4$;

n is 0 or 1; and

the pharmaceutically acceptable hydrohalide addition salts thereof.

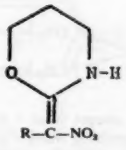
3,907,790

TETRAHYDRO-2-(NITROMETHYLENE)-2H-1,3-OXAZINES

Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1974, Ser. No. 502,115
Int. Cl.² C07D *265/00, 273/00, 295/00*
U.S. Cl. 260—244 3 Claims

1. A compound of the formula



wherein R is hydrogen, chloro, bromo or $—C(O)OCH_3$.

3,907,791

BIS-BASIC KETONES OF FLUORANTHENE

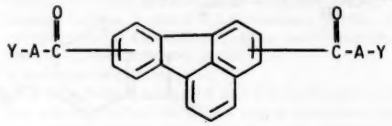
William L. Albrecht, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation of Ser. No. 32,348, April 27, 1970, abandoned. This application Nov. 22, 1972, Ser. No. 308,806

Int. Cl.[2] C07D *87/34*

U.S. Cl. 260—246 B 18 Claims

1. A compound selected from a base of the formula

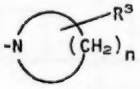


wherein each A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; and each Y is a member selected from the group consisting of

A. the group

wherein R^1 and R^2 are individually hydrogen, (lower)alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl of from 3 to 6 carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group; or

B. the group

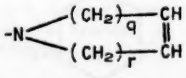


wherein *n* is a whole integer of from 4 to 6 and R^3 is hydrogen, (lower)alkyl of from 1 to 4 carbon atoms, phenyl, or benzyl linked to any one of the carbon atoms of the hetrocyclic group; or

C. the group

wherein X is oxygen or NR^4, and R^4 is hydrogen or (lower)alkyl of from 1 to 4 carbon atoms; or

D. the group



wherein *q* is a whole integer from 1 to 2, and *r* is a whole integer from 1 to 3 providing when *r* is equal to 3, *q* is 1;

or a pharmaceutically acceptable acid addition salt of said base.

3,907,792

PHENOXY-ALKYL-CARBOXYLIC ACID DERIVATIVES AND THE PREPARATION THEREOF

Andre Mieville, Chemin de Pierre-Fleur 7, 1000 Lausanne, Switzerland

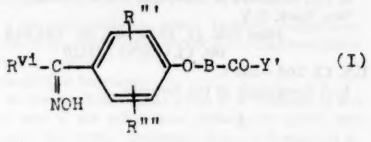
Continuation-in-part of Ser. No. 8,071, Feb. 2, 1970. This application Jan. 24, 1973, Ser. No. 326,188

Claims priority, application Switzerland, Jan. 31, 1969, 1517/69; Aug. 28, 1969, 13022/69

Int. Cl.[2] C07D *295/04*

U.S. Cl. 260—247.2 B 7 Claims

1. A compound of the formula



(I)

wherein

B is selected from the group consisting of CR''R' and CHR'—A in which R' is H or C_6H_5, A is a C_1–C_3 alkyl group, R'' and R' may be identical or different and represent H, CH_3, C_2H_5; R''' and R'''' may be identical or different and represent H, F, Cl or Br or a C_1–C_5 alkyl group;

R'' represents H or a C_{1-5} alkyl group;

Y' represents NR_3R_4 or O–alkylene—NR_3R_4, wherein R_3 and R_4, may be identical or different and represent H, lower alkyl having from 1 to 5 carbon atoms, a C_{3-7} cycloalkyl group or R_3 and R_4 considered together form with the nitrogen atom to which they are bound a member selected from group consisting of a 5- to 7- membered heterocyclic ring which may be interrupted with a second heteroatom selected from O, S and N and which may be substituted with a methyl group.

3,907,793

3-HYDROXY-3-MORPHOLINO-LOWERALKYL-3,4-DIHYDRO-2H-1,5-BENZODIOXEPIN PRODUCTS

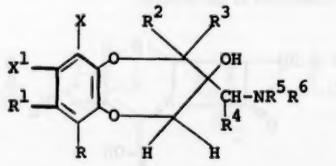
Burton K. Wasson, Valois, and Haydn W. R. Williams, Dollard des Ormeaux, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 249,422, May 1, 1972, Pat. No. 3,812,150, which is a division of Ser. No. 832,879, June 9, 1969, Pat. No. 3,700,691. This application Nov. 21, 1973, Ser. No. 417,869

Int. Cl. C07d *87/32*

U.S. Cl. 260—247.7 A 5 Claims

1. A 3,3-disubstituted-benzodioxepin having the structure



and acid addition salts thereof wherein

R is selected from hydroxy, hydroxy, lower alkyl and lower alkoxy;

R^1 is selected from hydrogen, chloro, bromo, lower alkyl, nitro, amino, C_{1-3} alkylsulfonylamino, C_{1-3} alkoxycarbonylamino, lower carbalkoxyamino, hydroxy and lower alkoxy;

X and X_1 are selected from hydrogen, lower alkyl and halogen;
R_2 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkyl and lower cycloalkyl;
R^3 is selected from hydrogen, lower alkyl, phenyl and phenyl-lower alkyl;
R^4 is selected from hydrogen and lower alkyl;
R^5 is selected from hydrogen, lower alkyl, and 2-phenyl-2-hydroxyethyl,
R^6 is morpholino-lower alkyl.

3,907,794
TREATMENT OF CHLORINATED ISOCYANURATE WASTE STREAMS

Ronald H. Carlson, Willingboro, and Raymond N. Mesiah, Somerset, both of N.J., assignors to FMC Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,914
Int. Cl. C07d *55/36*
U.S. Cl. 260—248 A **7 Claims**

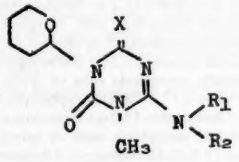
1. A process for recovering isocyanurate values from an aqueous waste stream having a pH from about 0.5 to about 7.0 and containing dissolved therein chlorinated isocyanurate values, which comprises: contacting said waste stream with a compound selected from the group consisting of (a) sulfur dioxide and (b) an alkali metal sulfur-containing reducing compound at a pH from about 0.5 to about 12.0 to dechlorinate the chlorinated isocyanurate values, and recovering the isocyanurate values therefrom.

3,907,795
3-(TETRAHYDRO-2-PYRANYL)-1,3,5-TRIAZINEDIONES AND THEIR USE AS HERBICIDES

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 24, 1974, Ser. No. 473,226
Int. Cl.² C07D *251/10*
U.S. Cl. 260—249.5 **3 Claims**

1. A compound of the formula:



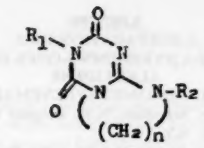
wherein
X is oxygen or sulfur;
R_1 is hydrogen or methyl; and
R_2 is methyl.

3,907,796
IMIDAZO-S-TRIAZINEDIONES AND BYRIMIDO-S-TRIAZINEDIONES

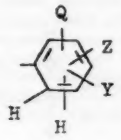
Richard A. Jewell, Landenberg, Pa., and Kang Lin, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 24, 1974, Ser. No. 473,225
Int. Cl.² C07D *251/08*
U.S. Cl. 260—249.5 **3 Claims**

1. A compound of the formula:



wherein
R_1 is alkyl of 2 through 8 carbon atoms, alkenyl of 3 through 6 carbon atoms, alkynyl of 3 through 6 carbon atoms, cycloalkyl of 4 through 8 carbon atoms, cycloalkenyl of 5 through 8 carbon atoms, cycloalkylmethyl of 4 through 9 carbon atoms, cycloalkenylmethyl of 6 through 9 carbon atoms, bicycloalkyl or bicycloalkenyl of 7 through 10 carbon atoms, bicycloalkylmethyl or bicycloalkenylmethyl of 8 through 11 carbon atoms, trimethylcyclohexyl, tetramethylcyclohexyl, tetrahydro-2-pyranyl; or



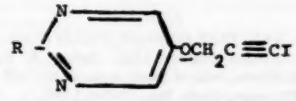
wherein
Q is hydrogen, fluorine, chlorine, bromine, alkyl of 1 through 4 carbon atoms, alkoxy, or alkylthio of 1 through 2 carbon atoms, nitro, or trifluoromethyl;
Y is hydrogen, chlorine, or methyl; and
Z is hydrogen or chlorine;
the above alkyl groups substituted with one methoxy, ethoxy, methylthio, or ethylthio group; the above cycloalkyl groups substituted with one alkyl of 2 through 4 carbon atoms, 1 through 2 methyl groups, 1 through 2 chlorines or bromines, one methoxy or one ethoxy group;
R_2 is hydrogen or methyl; and
n is 2 or 3.

3,907,797
5-(3-IODINEPROPARGYLOXY)PYRIMIDINES

Zdenek Budesinsky; Vladimir Janata; Alois Svab; Ladislav Bruna; Alois Capek, and Antonin Simek, all of Prague, Czechoslovakia, assignors to SPOFA, United Pharmaceutical Works, Prague, Czechoslovakia

Filed Dec. 14, 1972, Ser. No. 314,991
Claims priority, application Czechoslovakia, Dec. 15, 1971, 08609-71
Int. Cl. C07d *51/36*
U.S. Cl. 260—251 R **10 Claims**

1. 5-(3-iodinepropargyloxy)pyrimidine of the formula



wherein R is selected from the group consisting of hydrogen, straight chain alkyl, alkoxy, alkylthio, alkyl sulfinyl, and alkylsulfonyl, each of 1 to 4 carbon atoms.

3,907,798
PREPARATION OF 4H-PYRIDO[1,2-A]PYRIMIDIN-4-ONES FROM CYCLIC ALKYLIDENE 2-PYRIDYLAMINOMETHYLENEMALONATES

George Y. Lesher, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

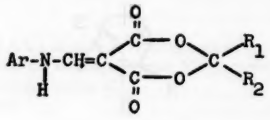
Division of Ser. No. 82,170, Oct. 19, 1970, Pat. No. 3,798,227, which is a division of Ser. No. 735,566, June 10, 1968, Pat. No. 3,642,797, which is a continuation-in-part of Ser. No. 640,359, May 22, 1967, abandoned, which is a continuation-in-part of Ser. No. 464,850, June 17, 1965, abandoned. This application Apr. 13, 1973, Ser. No. 350,948

Claims priority, application United Kingdom, June 15, 1966, 26787/66

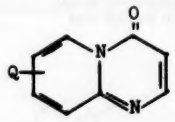
Int. Cl.[2] C07D *471/04*, *487/04*

U.S. Cl. 260—256.4 F 3 Claims

1. The process which consists of heating a compound of the formula



where R_1 and R_2 are each lower-alkyl, and Ar is 2-pyridyl substituted at available ring carbon positions by from one to three lower-alkyl substituents or a single substituent selected from the group consisting of lower-alkoxy, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl, trihalomethyl, lower-alkylamino, lower-alkanoylamino, hydroxy and benzyl, where lower-alkyl in each instance has from one to six carbon atoms, to form a 4H-pyrido[1,2-a]pyrimidin-4-one of the formula



where Q represents from one to three lower-alkyl substituents or a single substituent at positions selected from 6, 7, 8 and 9 of the pyridopyrimidine nucleus, said single substituent selected from those given above as substituents of 2-pyridyl.

3,907,799
XANTHINE OXIDASE INHIBITORS

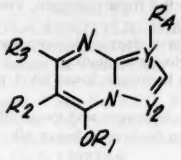
Darrell E. O'Brien, Mission Viejo; Roland K. Robins, and Lionel N. Simon, both of Santa Ana, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Continuation of Ser. No. 172,196, Aug. 16, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 440,989

Int. Cl.[2] C07D *239/00*

U.S. Cl. 260—256.4 F 10 Claims

1. A compound of the structure



wherein Y_1 and Y_2 are C or N;

R_1 is H or an alkali metal or ammonium;

R_2 is H, CH_3, halogen, or NO_2;

R_3 is OR_1, H, or halogen;

and R_4 is H, NO_2 or halogen; provided that when one of Y_1 or Y_2 is C, the other is N;

that when Y_1 is C, Y_2 is N and R_2 is H, R_3 is H, halogen or OR_1 where R_1 is an alkali metal or ammonium and R_2 is H, CH_3, NO_2 or halogen; and that when Y_1 is N and Y_2 is C, R_4 is H.

3,907,800
DERIVATIVES OF SPIRO-[PIPERIDINE-4′:6-(3,2-a)-THIAZOLOPYRIMIDINE]

Szarvasi Etienne, Charbonnieres-les-Bains; Festal Didier, Ecully, and Grand Marcel, Bron, all of France, assignors to Lipha-Lyonnaise Industrielle Pharmaceutique, Lyon, France

Filed Aug. 6, 1973, Ser. No. 385,816

Claims priority, application France, Aug. 9, 1972, 72.28747

Int. Cl.[2] C07D *513/10*

U.S. Cl. 260—256.5 R 11 Claims

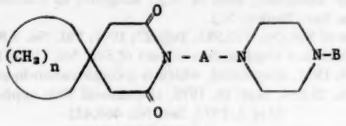
1. A compound selected from the group consisting of pharmaceutically acceptable salts of spiro[1′-n-butyl-4′:6-piperidine-3-(2,5-dimethoxyphenyl)-3-n-butyl-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine];
pharmaceutically acceptable salts of spiro[1′-benzyl-4′:6-piperidine-3-hydroxy-3-hydroxy-3-(2-naphthyl)-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine];
pharmaceutically acceptable salts of spiro[1′-benzyl-4′:6-piperidine-3-(2,5-dimethoxyphenyl)-3-hydroxy-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine];
pharmaceutically acceptable salts of spiro[1′-benzyl-4′:6-piperidine-(3,4-dichlorophenyl)-3-hydroxy-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine];
pharmaceutically acceptable salts of spiro[1′-benzyl-4′:6-piperidine-3-hydroxy-3-(5,6,7,8-tetrahydro-2-naphthyl)-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine]
pharmaceutically acceptable salts of spiro[1′-n-octyl-4′:6-piperidine-3-(3,4-dichlorophenyl)-3-hydroxy-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine];
Spiro[1′-n-butyl-4′:6-piperidine-3-(2-naphthyl)-4,5,6,7-tetrahydro-[3,2-a]thiazolopyrimidine] and pharmaceutically acceptable salts thereof;
pharmaceutically acceptable salts of spiro[1′-n-octyl-4′:6-piperidine-3-hydroxy-3-(2,5-dimethoxyphenyl)-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine];
pharmaceutically acceptable salts of spiro[1′-benzyl-4′:6-piperidine-3-hydroxy-3-(2-methoxyphenyl-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine]; and
pharmaceutically acceptable salts of spiro[1′-n-octyl-4′:6-piperidine-3-hydroxy-3-(2-methoxyphenyl)-2,3,4,5,6,7-hexahydro-[3,2-a]-thiazolopyrimidine].

3,907,801
N-[(4-PYRIDYL-PIPERAZINO)-ALKYL]-AZASPIROALKANEDIONES

Yao Hua Wu, and James W. Rayburn, both of Evansville, Ind., assignors to Mead Johnson and Company, Evansville, Ind.

Division of Ser. No. 879,604, Nov. 24, 1969, Pat. No. 3,717,634. This application Dec. 6, 1972, Ser. No. 312,543
Int. Cl.[2] C07D *51/72*
U.S. Cl. 260—268 BC 7 Claims

1. A compound selected from the group consisting of a compound having the formula

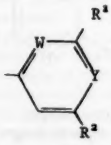


wherein

n is the integer 4 or 5;

A is a divalent straight or branched alkylene chain of 2 to 6 carbon atoms inclusive and connects the nitrogen atoms as shown through at least 2 carbon atoms;

B is a group having the formula



wherein one of W and Y is CH and the other is nitrogen and R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl of from 1 to 4 carbon atoms inclusive, and lower alkoxy of from 1 to 4 carbon atoms inclusive;

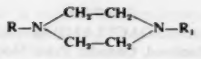
and the non-toxic pharmaceutically acceptable acid addition salts thereof.

3,907,802
PROCESSES FOR PREPARATION AND USE OF N-ALKYLPIPERAZINES

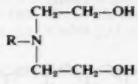
Gunther Demmering, Solingen-Grafrath, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Mar. 29, 1974, Ser. No. 456,034
Claims priority, application Germany, Apr. 2, 1973, 2316358; June 7, 1973, 2329057
Int. Cl.[2] C07D *295/02*
U.S. Cl. 260—268 SY 10 Claims

1. A process for the preparation of a piperazine having at least one long-chain alkyl attached to a nitrogen, of the formula



wherein R is selected from the group consisting of alkyl having 8 to 22 carbon atoms and cycloalkyl having 6 to 10 carbon atoms, and R_1 is selected from the group consisting of hydrogen and methyl, by catalytic aminolysis of N-alkyl-ated-diethanolamine, comprising the steps of reacting an N-alkyl-diethanolamine of the formula



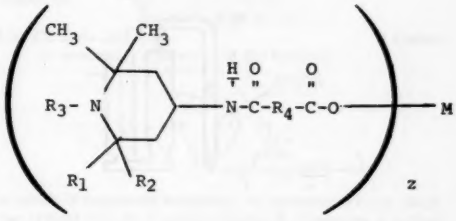
wherein R has the same meanings as defined above, with at least 3 moles of the reactant NH_2-R_1 wherein R_1 has the same meanings as defined above, per mol of said N-alkyl-diethanolamine at a temperature above 150°C in the presence of hydrogen at superatmospheric pressure and in the presence of a catalytic amount of a hydrogenation catalyst selected from the group consisting of chromium oxide-zinc oxide, aluminum oxide-zinc oxide and the mixtures thereof; and recovering said piperazine having at least one long-chain alkyl attached to a nitrogen.

3,907,803
HINDERED PIPERIDINE CARBOXAMIDE ACIDS AND METAL SALTS THEREOF

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,327
Int. Cl.[2] C07D *211/58*
U.S. Cl. 260—270 9 Claims

1. A compound of the formula



wherein R_1 and R_2 independently of each other are straight- or branched-chain lower alkyl having 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, B-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl, α-methylbenzyl, p-methylbenzyl, or α,p-dimethylbenzyl,

R_4 is straight- or branched-chain alkylene having 1 to 8 carbon atoms, phenylene, or the group $-(CH_2)_m Y(CH_2)_n-$, wherein Y is oxygen or sulfur and *m* and *n* independently of each other are an integer of from 1 to 3,

M is hydrogen or a metal selected from the group consisting of barium, nickel, manganese, calcium, zinc, iron, sodium, cobalt, tin, dialkyl tin, and

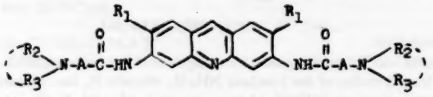
z has a value of from 1 to 4, the value of *z* being the same as the available valence of M.

3,907,804
3,6-BIS-(AMINOACYLAMINO)-ACRIDINES

Ernest Cullen, Montreal, Canada; Peter Meindl, Vienna, Austria; Hans Tuppy, Vienna, Austria, and Gerhard Bodo, Vienna, Austria, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein and Dr. Karl Thomae GmbH, Biberach an der Riss, both of, Germany

Filed June 4, 1973, Ser. No. 366,732
Claims priority, application Austria, June 7, 1972, 4878/72
Int. Cl.² C07D *219/06*
U.S. Cl. 260—279 R 5 Claims

1. A compound of the formula



wherein

R_1 is hydrogen or methyl,

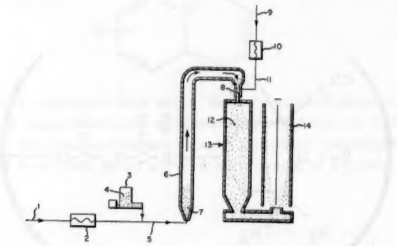
R_2 and R_3 are each hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkylamino-lower alkyl, 3–8 carbon cycloalkyl, benzyl, or phenyl, and

A is lower alkylene or phenyl-lower alkylene, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

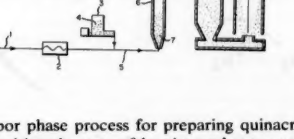
3,907,805
PREPARATION OF QUINACRIDONES BY VAPOR PHASE DEHYDROGENATION OF DIHYDROQUINACRIDONES

Keh-Kuang Lin, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1973, Ser. No. 426,472
Int. Cl.² C09B *48/00*
U.S. Cl. 260—279 R 11 Claims



1. A vapor phase process for preparing quinacridone pigment comprising the step of heating at least one 6,13-dihydroquinacridone of the formula



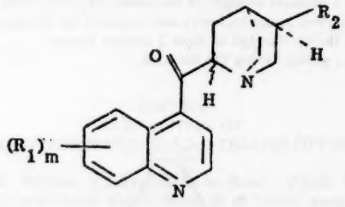
where X and Y are selected from the group consisting of F, Cl, Br, alkyl having 1 to 3 carbon atoms and alkoxy having 1 to 3 carbon atoms, or combinations thereof, and *k* and *m* are integers from 0 to 2, inclusive, to a temperature from at least the sublimation temperature thereof to 660°C. in the presence of a gaseous mixture inert to said 6,13-dihydroquinacridone and said quinacridone pigment, and collecting said quinacridone pigment.

3,907,806
PROCESSES AND INTERMEDIATES FOR QUININE, QUINIDINE AND ANALOGS THEREOF

Guenter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

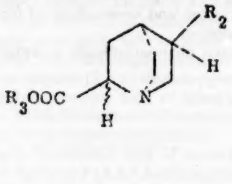
Division of Ser. No. 166,583, July 27, 1971, Pat. No. 3,823,146 which is a continuation-in-part of Ser. No. 117,131, Feb. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 20,034, Mar. 16, 1970, abandoned. This application May 2, 1974, Ser. No. 466,422
Int. Cl.² C07D *453/00*
U.S. Cl. 260—284 6 Claims

1. A process for preparing an epimeric compound of the formula



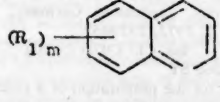
enantiomer or racemate thereof,

wherein m is 1 or 2; R_1 is hydrogen, hydroxy, halogen, trifluoromethyl, methyl, ethyl, propyl, butyl or methoxy, or when m is 2, with an adjacent R_1, is also methylenedioxy; and R_2 is ethyl or vinyl which comprises the step of reacting the corresponding epimeric compound of the formula



wherein

R_3 is lower alkyl of 1 to 7 carbon atoms or benzyl and R_2 is as previously described enantiomer or racemate thereof, with a 4-quinolyllithium compound of the formula



wherein R_1 and m are as previously described.

3,907,807

BENZOQUINOLIZINE DERIVATIVES AND PROCESS FOR THEIR PREPARATION AND USE

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wülf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

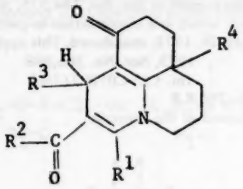
Filed Feb. 28, 1973, Ser. No. 336,476

Claims priority, application Germany, Sept. 12, 1972, 2210623

Int. Cl.[2] C07D *215/20*

U.S. Cl. 260—287 R 19 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen or lower alkyl;

R^2 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy or lower alkynyloxy;

R^3 is lower alkyl, lower alkenyl, lower alkynyl; phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of 1-3 lower alkyl, 1-3 lower alkoxy, 1-3 halogeno, 1-2 nitro, 1 cyano, 1-3 trifluoromethyl, 1 azido, 1-3 carbo(lower alkoxy),1 lower alkylsulfonyl, 1 lower alkylsulfinyl, and 1 lower alkylthio; napthyl; or a heterocyclic ring selected from the group consisting of quinolyl, isoquinolyl, pyridyl, and pyrryl, said heterocyclic ring being unsubstituted or substituted by one or two members selected from the group consisting of non-tertiary lower alkyl, lower alkoxy and halogeno; and

R^4 is hydrogen or carbo(lower alkoxy).

3,907,808

1,4-DIHYDRO-4-OXO-7-PYRIDYL-3-QUINOLINECARBOXYLIC ACID DERIVATIVES

George Y. Lesher, and Philip M. Carabateas, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 144,307, May 17, 1971, Pat. No. 3,753,993. This application May 3, 1973, Ser. No. 356,820

Int. Cl. C07d *33/48*

U.S. Cl. 260—287 R 16 Claims

1. A compound selected from: 1-R_1-1,4-dihydro-3-(COOR)-4-oxo-5(or 6)-R′-7-PY-quinoline where R_1 is non-tertiary lower-alkyl, lower-hydroxyalkyl or lower-haloalkyl, R is hydrogen, non-tertiary lower-alkyl or CH_2OAc where Ac is lower-alkanol or benzoyl, R′ is halo, non-tertiary lower-alkyl or lower-alkoxy or R′ is hydrogen when R is CH_2OAc, and PY is Q-1-$(O)_n$-4(3 or 2)-pyridyl, Q-1-Q′-4(3 or 2)-piperidyl or 1-(lower-alkyl)-1,2-dihydro-2-oxo-4-pyridyl, where *n* is zero of 1, Q is from zero to four substituents selected from non-tertiary lower-alkyl where two of four said substituents at the 3- and 5- positions of 4-pyridyl can be replaced by lowercarbalkoxy or carboxy, or Q is from one to two substituents selected from lower-alkoxy, halo, hydroxy, lower-alkanoyloxy, hydroxymethyl, formyl, carboxy and lower-carbalkoxy where one of the two said substituents can be replaced by non-tertiary lower-alkyl, or Q is a single substituent selected from aminomethyl, lower-alkanoylaminomethyl, amino, cyano and carbamyl, and Q′ is hydrogen or non-tertiary lower-alkyl, where lower in each of lower-alkyl, loweralkoxy, lower-alkanoyl and alkoxy of lower-carbalkoxy designates from one to six carbon atoms and in each of lowerhydroxyalkyl and lowerhaloalkyl designates from two to six carbon atoms; and, a medicinally acceptable salt thereof.

3,907,809

3,5-SUBSTITUTED-1,2,4-OXADIAZOLE INNER QUATERNARY AMMONIUM SALTS

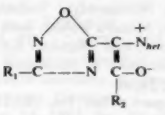
Anne Mary Von Esch, North Chicago, and Aldo Joseph Crovetti, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 85,747, Oct. 30, 1970, Pat. No. 3,725,424. This application Dec. 18, 1972, Ser. No. 316,189

Int. Cl.[2] C07D *215/38*

U.S. Cl. 260—288 CE 1 Claim

1. The compound of the formula



in which N_{het} is selected from the group consisting of quinolinium; halo and loweralkyl substituted quinolinium; isoquinolinium; halo and loweralkyl substituted isoquinolinium; R_1 is selected from the group consisting of phenyl, loweralkylphenyl, nitrophenyl, dinitrophenyl, nitrofuryl, and nitrothienyl; and R_2 is selected from the group consisting of hydrogen and a loweralkyl wherein said lower alkyl groups have from 1–4 carbon atoms.

3,907,810

1-(IMIDAZOLYLALKYLENE)-PIPERIDINES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & - Brother Limited, Maidenhead, England

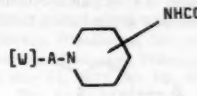
Continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, which is a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,027

Claims priority, application United Kingdom, Sept. 3, 1970, 42090/70

Int. Cl.[2] C07D *211/58*

U.S. Cl. 260—293.7 2 Claims

1. An imidazolyl compound of the formula:



(I)

in which W represents imidazolyl, A represents a lower alkylene radical of 1 to 4 carbon atoms, R represents a radical selected from phenyl and phenyl substituted by halogen, lower alkoxy, lower alkyl, or lower alkylenedioxy or a pharmaceutically acceptable acid addition salt thereof.

3,907,811

STEREOISOMERIC FORMS OF 4-ANILIDO-3-METHYL-IPERIDINE-1-CARBOXYLATES

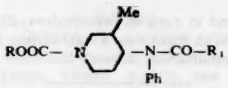
Paul Adriaan Jan Janssen, Vosselaar; Willem Florent Maria Van Bever, and Raymond Antoine Stokbroekx, both of Beerse, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 396,277, Sept. 11, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,269

Int. Cl.[2] C07D *211/58*

U.S. Cl. 260—293.77 10 Claims

1. A method of preparing the cis-(±)-isomeric form of a (±)-4-anilido-3-methyl-piperidinecarboxylate of the formula:



wherein R and R_1 each represent a member selected from the group consisting of loweralkyl and phenyl-lower alkyl, which comprises cooling a solution of said (±)-4-anilido-3-methyl-piperidinecarboxylate in a mixture of from about 1 : 3 to about 3 : 1 parts by volume of a dialkyl ether and an alkanol, each having a total of six carbons, to below 35° and mechanically separating the insoluble cis-(±)-isomer, substantially free of the trans-(±)-isomer

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3,907,812

BUTYROPHENONE DERIVATIVES

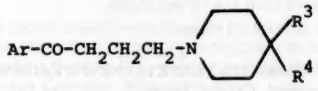
Hisao Yamamoto, Nishinomiya; Tadashi Okamoto, Ashiya; Kikuo Sasajima; Masaru Nakao, both of Toyonaka; Isamu Maruyama, Minoo, and Shigenari Katayama, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 180,181, Sept. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 54,836, July 14, 1970, abandoned. This application Feb. 2, 1973, Ser. No. 329,130

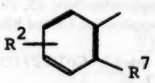
Int. Cl.[2] C07D *211/52*

U.S. Cl. 260—293.77 **17 Claims**

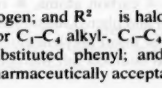
1. A compound of the formula,



wherein Ar is a group having the formula,



(wherein R^7 is amino or C_1–C_5 alkanoylamino; and R^2 is hydrogen or halogen), or a group having the formula,



(wherein X is halogen; and R^2 is halogen); R^3 is hydrogen or unsubstituted or C_1–C_4 alkyl-, C_1–C_4 alkoxy-, halogen- or trifluoromethyl-substituted phenyl; and R^4 is hydrogen or hydroxyl, and a pharmaceutically acceptable acid addition salt thereof.

3,907,813

STEREOISOMERIC FORMS OF 4-ANILINO-3-METHYL PIPERIDINES

Paul Adriaan Jan Janssen, Vosselaar (Turnhout); Willem Florent Maria Van Bever, and Raymond Antoine Stokbroekx, both of Beerse, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 396,277, Sept. 11, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,268

Int. Cl.[2] C07D *211/58*

U.S. Cl. 260—293.79 **13 Claims**

1. A method of resolving cis-(±)-4-anilino-3-methylpiperidine which comprises dissolving cis-(±)-4-anilino-3-methylpiperidine with (+)-tartaric acid in a heated lower alkanol, adding a lower alkanone to said heated solution till turbidity occurs, cooling the solution to below 35°C and mechanically separating the insoluble cis-(−)-4-anilino-3-methylpiperidine (+)-tartrate salt.

3,907,814

2-ALKOXY(AND 2-ALKOXYALKYL)-2-PYRIDYL-THIOACETAMIDES

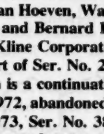
Helene E. Bowman Van Hoeven, Wallingford; L. Martin Brenner, Upper Darby, and Bernard Loev, Broomall, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 284,375, Aug. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 248,512, April 28, 1972, abandoned. This application Aug. 9, 1973, Ser. No. 386,898

Int. Cl.[2] C07D *213/83*

U.S. Cl. 260—294.8 E **10 Claims**

1. A compound of the formula:

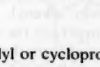


in which:

m is 0, 1 or 2;

R_1 is 2-pyridyl;

R_2 is lower alkyl, allyl or cyclopropanemethyl;



NH-phenyl or NH-$(CH_2)_n$-cycloalkyl, said cycloalkyl having 3-6 carbon atoms;

R_4 is hydrogen or lower alkyl;

R_5 and R_6 are hydrogen or lower alkyl and

n is 0 or 1

or a pharmaceutically acceptable acid addition salt thereof.

3,907,815

PROCESS FOR PREPARING PHOSPHOROTHIOATES AND PHENYLPHOSPHONOTHIOATES

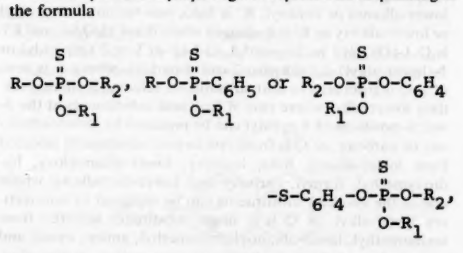
Lorraine M. Kroposki, Walnut Creek, Calif., and Masao Yoshimine, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 187,139, Oct. 6, 1971, abandoned. This application May 21, 1973, Ser. No. 361,937

Int. Cl.[2] C07D *213/83*

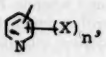
U.S. Cl. 260—294.8 K **15 Claims**

1. In the process of preparing a compound corresponding to the formula



wherein:

R_1 and R_2 are each independently lower alkyl; and



wherein:

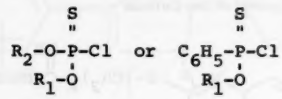
n is 0, 1 2 or 3; and

X is nitro, cyano, halo, lower alkyl, lower alkoxy, lower alkylthio or lower alkylsulfinyl, with the proviso that R does not bear more than one nitro group, lower alkylthio group or lower alkylsulfinyl group;

by reacting in an inert liquid reaction medium under neutral or alkaline conditions (a) a compound corresponding to the formula

$R—O^-M^+$ or $M^+O^-—C_6H_4—S—C_6H_4—O^-M^+$

with (b) a compound corresponding to the formula



wherein M is an alkali metal and R, R_1 and R_2 have the aforesaid meaning;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of (1) a quaternary ammonium salt having a minimum solubility of at least 1 weight percent in the liquid reaction medium at 25°C and (2) 1,4-diazabicyclo[2.2.2]octane.

3,907,816

1-ALKYL-2-(PYRIDYLTHIOMETHYL)-5-NITRO-IMIDAZOLES AND DERIVATIVES THEREOF AS WELL AS PROCESS FOR THEIR MANUFACTURE

Erhardt Winkelmann, Kelkheim Tunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

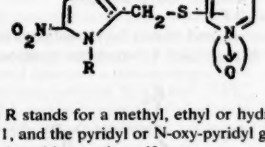
Filed May 16, 1974, Ser. No. 470,666

Claims priority, application Germany, May 18, 1973, 2325159; June 14, 1973, 23330279

Int. Cl.² C07D *213/70*

U.S. Cl. 260—294.8 G **19 Claims**

1. A compound of the formula



(I)

in which R stands for a methyl, ethyl or hydroxyethyl group, *n* is 0 or 1, and the pyridyl or N-oxy-pyridyl group is linked in 2-, 3- or 4-position to the sulfur atom.

3,907,817

PYRIDINE DERIVATIVES OF [1-(3-PHENANTHRYL)ETHYLIDENE]HYDRAZINE

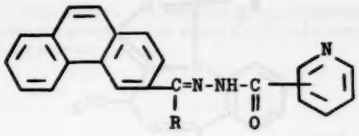
Keith Chadwick Murdock, Pearl River, and Robert Alton Herndon, Tomkins Cove, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 29, 1974, Ser. No. 437,550

Int. Cl.² C07D *213/77*

U.S. Cl. 260—295 H **4 Claims**

1. A compound of the formula:



wherein R is loweralkyl C_1—C_4, or a pharmaceutically acceptable acid addition salt thereof.

3,907,818

TRICYCLOALKYL TIN 1,2,4-TRIAZOLE COMPOUNDS

Karl Heinz Buchel, Wuppertal-Elberfeld, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

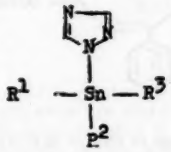
Filed Aug. 14, 1972, Ser. No. 280,622

Claims priority, application Germany, Aug. 28, 1971, 2143252

Int. Cl.² C07D *249/08*

U.S. Cl. 260—299 **3 Claims**

1. A tin trialkyl 1,2,4-triazole of the formula



I

in which R^1, R^2 and R^3 each independently is cyclopentyl or cyclohexyl.

3,907,819

PERHALOGENATED THIAZOLES

Frank Edward Herkes, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1973, Ser. No. 360,938

Int. Cl.² C07D *277/20*

U.S. Cl. 260—302 R **6 Claims**

1. A perhalogenated thiazole compound selected from 4,5-dichloro-2-fluorothiazole, 2-bromo-4,5-dichlorothiazole, 4-chloro-2,5-dibromothiazole,5-bromo-4-chloro-2-fluorothiazole or 4,5-dibromo-2-fluorothiazole.

3,907,820

BENZODIAZEPINE DERIVATIVES

Kanji Meguro, Nishinomiya, and Yutaka Kuwada, Ashiya, both of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

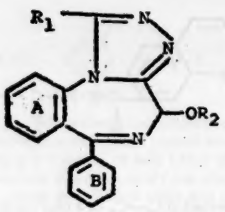
Filed Mar. 5, 1970, Ser. No. 16,970

Claims priority, application Japan, Mar. 8, 1969, 44-17663

Int. Cl.² C07D *243/20*, *487/04*

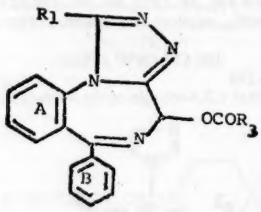
U.S. Cl. 260—308 R **12 Claims**

1. A member selected from the group consisting of a compound of the formula



wherein R_1 is hydrogen or alkyl of up to 6 carbon atoms, R_2 is hydrogen or lower alkyl, the rings A and B are unsubstituted or substituted by one member selected from the group consisting of nitro, trifluoromethyl, halogen, lower alkyl and lower alkoxy, which can be the same or different, and pharmaceutically acceptable acid salts thereof.

7. A compound selected from the group consisting of a compound of the formula



wherein R_1 is hydrogen or alkyl of up to 6 carbon atoms, R_3 is alkyl of 1–4 carbon atoms and the rings A and B are unsubstituted or substituted by one member selected from the group consisting of nitro, trifluoromethyl, halogen, lower alkyl and lower alkoxy, which can be the same or different, and acid salts thereof.

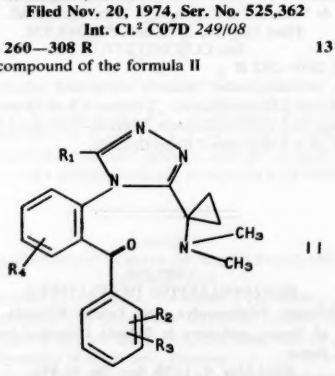
3,907,821

2-[3-[1-(DIMETHYLAMINO)CYCLOPROPYL[-4H-1,2,4-TRIAZOL-4-YL[BENZOPHENONE

Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 20, 1974, Ser. No. 525,362
Int. Cl.[2] C07D *249/08*
U.S. Cl. 260—308 R **13 Claims**

1. A compound of the formula II



II

wherein R_1 is hydrogen, methyl, (dimethylamino)methyl or hydroxymethyl; wherein R_2 is hydrogen, chloro, or fluoro; wherein R_3 is hydrogen or fluoro with the proviso that R_3 is not fluoro, if R_2 is chloro; and wherein R_4 is hydrogen, chloro, fluoro, bromo, nitro, or trifluoromethyl; and the pharmacologically acceptable acid addition salts thereof.

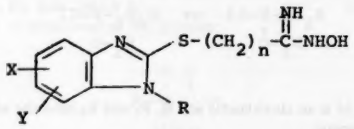
3,907,822

ANTI-INFLAMMATORY (2-BENZIMIDAZOYLTHIO)ALKYLAMIDOXIMES

Venkatachala L. Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 11, 1973, Ser. No. 369,044
Int. Cl.[2] A61K *27/00;* **C07D** *49/38*
U.S. Cl. 260—309.2 **5 Claims**

1. A compound of the formula



wherein X and Y are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, nitro, halo, phenyl, naphthyl, phenoxy, naphthyloxy, and substituted phenyl and phenoxy wherein said substituent is fluoro, chloro, bromo, iodo, nitro, trifluoromethyl, lower alkyl, or lower alkoxy; R is selected from the group consisting of hydrogen, lower alkyl, phenyl, naphthyl, and substituted phenyl wherein said substituent is fluoro, chloro, bromo, iodo, nitro, trifluoromethyl, lower alkyl or lower alkoxy; and *n* is an integer from one to six; and acid addition salts thereof.

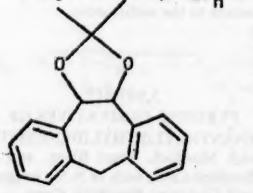
3,907,823

DIBENZOCYCLOHEPTAN-DIOXOLAN DERIVATIVES AND THEIR PREPARATION METHOD

Rene Viterbo, Paris, France; Giovanni Brancaccio, and Giulio Cesare Perri, both of Naples, Italy, assignors to Richardson-Merrell S.p.A., Naples, Italy

Filed Apr. 9, 1974, Ser. No. 459,272
Int. Cl.[2] C07D *295/00*
U.S. Cl. 260—247.7 E **6 Claims**

1. A compound selected from a 3a,12b-dihydro-8H-dibenzo-[3,4:6,7]cyclohepta]1,2-d]-1,3-dioxolan compound having the formula



and a pharmaceutically acceptable acid addition salt thereof, wherein R_1 and R_2 are each hydrogen; R_3 is selected from pyrrolidine, piperidine, morpholine, piperazine, and N'-(lower)-alkyl piperazine; n is selected from 0, 1, 2, 3.

3,907,824

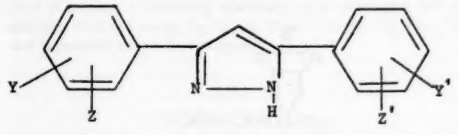
PREPARATION OF 1-ALKYL-3,5-DIPHENYLPYRAZOLES AND 1,2-DIALKYL-3,5-DIPHENYLPYRAZOLIUM SALTS

Murray Garber, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 18, 1973, Ser. No. 371,202
Int. Cl.[2] C07D 231/12
U.S. Cl. 260—310 R 16 Claims

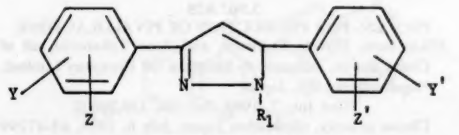
1. A method for the preparation of a compound having the formula:

where R_1 is alkyl C_1—C_4 and Y, Y', Z and Z' each represent a member selected from the group consisting of hydrogen, nitro, halogen, alkyl C_1—C_4, haloalkyl C_1—C_4 containing 1 to 4 halogen groups, and alkoxy C_1—C_4, comprising the steps of: reacting (1) a compound of the formula:

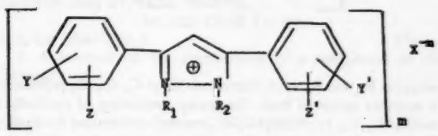


where Y, Y' Z and Z' are as defined above; with (2) from 1 to 1.5 equivalents of an alkylating agent represented by the formula $(R_1)_mQ$, where R_1 is as defined above and Q is a member selected from the group consisting of a halide, an organic sulfate, hydrogen sulfate, benzene sulfonate, C_1—C_4 alkoxybenzene sulfonate, phosphate, alkane sulfonate C_1—C_4; and *m* is an integer of from 1, 2 or 3; said reaction being conducted in the presence of a solid, anhydrous, inorganic, alkali metal base and a non-aqueous, inert, organic solvent at a temperature between 50°C. and 175°C., and recovering a 1-alkyl-3,5-diphenylpyrazole in good yield and purity.

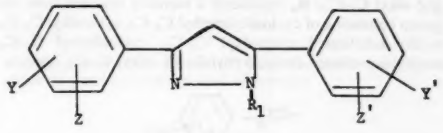
6. A method for converting a compound of the formula:



wherein R_1 is alkyl C_1—C_4 and Y, Y', Z and Z' each represent a member selected from the group consisting of hydrogen, halogen, nitro, alkyl C_1—C_4, haloalkyl C_1—C_4 containing from 1 to 4 halogen groups, and an alkoxy C_1—C_4, to a compound having the formula:



where R_1, Y, Y' Z and Z' are as defined above; X is an anion having a charge of from 1 to 3; and m is an integer from 1 to 3, comprising the steps of: reacting a compound of the formula:



with from about 1 to 1.5 equivalents of an alkylating agent of the formula $(R_2)_mQ$, where R_2 is alkyl C_1—C_4, Q is a member selected from the group consisting of a halide, an organic sulfate, hydrogen sulfate, benzene sulfonate, C_1—C_4 alkoxy benzene sulfonate, C_1—C_3 alkylbenzene sulfonate, phosphate and alkane sulfonate C_1—C_4, and m is as defined above, carrying out said reaction in the presence of a non-aqueous mixture of inert organic solvents consisting of (a) a chlorinated hydrocarbon solvent and (b) an organic solvent selected from the group consisting of an aromatic hydrocarbon, an aliphatic hydrocarbon, high aromatic solvents having a mixed aniline point between 30°F. and 60°F., an aromatic content between 60% and 100% and a specific gravity at 60°/60°F. of 0.88 to 1.5, an aliphatic ketone, a dipolar aprotic solvent, a cyclic ether, an aliphatic alcohol and an alkoxy-alkyl ether, at a temperature between 50°C. and 175°C., and recovering a 1,2-dialkyl-3,5-diphenylpyrazolium salt in good yield and purity.

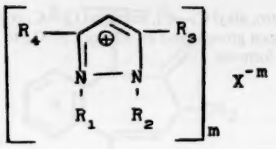
3,907,825

1,2-DIALKYL-3,5-DISUBSTITUTED PYRAZOLIUM SALTS AND THE USE THEREOF AS HERBICIDAL AGENTS

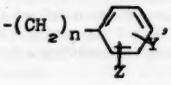
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 21, 1973, Ser. No. 399,785
Int. Cl.[2] C07D 231/12; A01N 9/22
U.S. Cl. 260—311 11 Claims

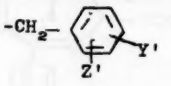
1. A compound having the formula:

(I) 

wherein R_1 and R_2 each represents alkyl C_1–C_4; R_3 represents a member selected from the group consisting of cycloalkylmethyl C_3–C_7, cycloalkyl C_3–C_7, methyl-substituted cycloalkyl C_3–C_7; cycloalkenyl C_3–C_7, methyl-substituted cycloalkenyl C_3–C_7,



and alkyl C_2–C_{11}; R_4 represents a member selected from the group consisting of cycloalkylmethyl C_3–C_7, cycloalkyl C_3–C_7, methyl-substituted cycloalkyl C_3–C_7, cycloalkenyl C_3–C_7, methyl-substituted cycloalkenyl C_3–C_7, alkyl C_2–C_{11} and



Y, Y', Z and Z' each represents members selected from the group consisting of hydrogen, halogen, nitro, methylthio, methylsulfonyl, cyano, carboxyl, carboalkoxy C_1–C_4, alkyl C_1–C_4, haloalkyl C_1–C_4 containing 1 to 4 halogen groups and alkoxy C_1–C_4; X represents an anion with a charge of from 1 to 3; *n* is 0 or 1 and *m* is an integer from 1 to 3.

3,907,826

NOVEL BENZO(B)THIOPHENE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Peter Johannes Stoss, Wildtal; Manfred Franz Reinhold Herrmann, Gundelfingen, and Gerhard Satzinger, Denzlingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

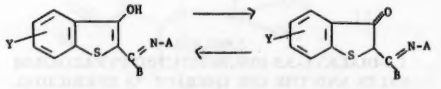
Filed Nov. 27, 1973, Ser. No. 419,305

Claims priority, application Germany, Nov. 27, 1972, 2258036

Int. Cl.² C07D *333/52*

U.S. Cl. 260—330.5 **16 Claims**

1. Novel benzo[b]thiophenes of the formula:



wherein Y is a hydrogen, or halogen atom; wherein A is a hydrogen atom, a phenyl group substituted with a halogen atom, or a phenyl group substituted with a lower alkoxy group; wherein B is a radical of the formula OR wherein R is an alkyl radical of 1 to 5 carbons.

3,907,827

ARYL KETALS OF POLYCYCLIC OXO COMPOUNDS AND PROCESSES

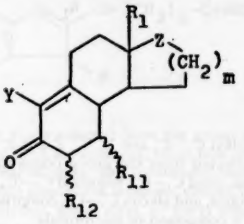
Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 74,519, Sept. 22, 1970, Pat. No. 3,758,509, which is a continuation-in-part of Ser. No. 11,023, Feb. 12, 1970, Pat. No. 3,708,500, which is a continuation-in-part of Ser. No. 824,319, May 13, 1969, Pat. No. 3,544,600, and a continuation-in-part of Ser. No. 825,389, May 16, 1969, abandoned. This application May 24, 1973, Ser. No. 363,443

Int. Cl.² C07D *317/48*

U.S. Cl. 260—340.5 **8 Claims**

1. A compound of the formula



where Y is

$R_5CH_2CCH(R_{14})CH(R_{15})$;

B is selected from the group consisting of phenylene, naphthalene and phenylene or naphthalene substituted by one or two alkyl groups having one to eight carbon atoms or alkoxy groups having one to eight carbon atoms; R_1 is a primary alkyl group of from 1 to 5 carbon atoms; R_5, R_{11}, R_{12}, R_{14} and R_{15} are each independently hydrogen or alkyl having one to eight carbon atoms; Z is carbonyl or a group of the formula

R_7 is hydrogen or alkanoyl having one to eight carbon atoms; R_8 is hydrogen or aliphatic hydrocarbyl having one to eight carbon atoms and m is an integer having a value of 1 to 2 and optical enantiomers thereof.

3,907,828

PROCESS FOR PRODUCTION OF PIVALOLACTONE

Mikio Sato; Hiroshi Fujiwara, and Asao Takahashi, all of Chiba, Japan, assignors to Maruzen Oil Company Limited, Nagahoribashi-Siji, Japan

Filed July 7, 1969, Ser. No. 339,700

Claims priority, application Japan, July 6, 1968, 43-47299

Int. Cl.² C07D *305/06*

U.S. Cl. 260—343.9 **3 Claims**

1. A process for the production of pivalolactone which comprises dehydrochlorinating monochloropivalic acid in vapor phase in the presence of a catalyst containing a metal

salt selected from the group consisting of phosphates and pyrophosphates of lithium and sodium.

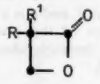
3,907,829

PRODUCTION OF 2,2-DISUBSTITUTED PROPIOLACTONES

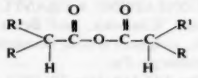
Jerry D. Holmes; Robert P. Allen, and John L. Dawes, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,567
Int. Cl.[2] C07D *305/12*
U.S. Cl. 260—343.9 18 Claims

1. A process for producting a 2,2-disubstituted propiolactone having the formula



whereby an isoanhydride having the formula



wherein R and R^1 individually may be straight or branched chain alkyl, having 1 to 10 carbon atoms, is reacted with formaldehyde or a formaldehyde yielding material at a temperature of from about 190°C. to about 400°C., in the presence of a catalyst consisting essentially of an oxide of a metal selected from the group Ag, U, Zn, Ti, Zr, Th, Ta, Nb, Mo, W and supported on an inert support.

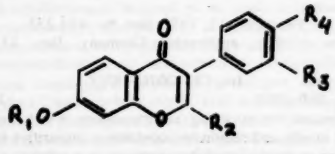
3,907,830

ISOFLAVONE DERIVATIVES

Laszlo Feuer; Mihaly Nogradi; Agnes Gottsegen; Borbala Vermes; Janos Streliszky; Andreas Wolfner; Lorant Farkas; Sandor Antus, and Maria Kovacs, all of Budapest, Hungary, assignors to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Continuation-in-part of Ser. No. 146,773, May 25, 1971, Pat. No. 3,833,730. This application June 19, 1973, Ser. No. 371,560
Claims priority, application Hungary, May 27, 1970, 01-996
Int. Cl.[2] C07D *311/26*
U.S. Cl. 260—345.2 3 Claims

1. A compound having the formula



wherein R_1 is halosubstituted, nitrosubstituted or unsubstituted benzyl, R_2 is hydrogen, methyl or carboxy and R_3 and R_4 are hydrogen or nitro.

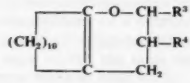
3,907,831

PROCESS FOR PREPARING LACTONES

Joseph J. Becker, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

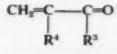
Division of Ser. No. 41,595, May 28, 1970, abandoned. This application Oct. 2, 1973, Ser. No. 402,760
Claims priority, application Switzerland, May 29, 1969, 8192/69; May 27, 1970, 7865/70
Int. Cl.[2] C07D *311/94*
U.S. Cl. 260—345.2 4 Claims

1. A method for the preparation of a compound of the formula



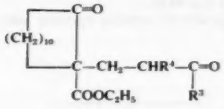
Vi

wherein R^3 and R^4 represent hydrogen, or one of them a methyl radical and the other hydrogen, which comprises adding to a 2-ethoxycarbonyl-cyclododecanone a compound of formula



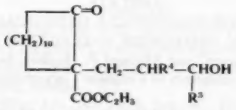
VI

wherein the symbols R^3 and R^4 have the same meaning as above to produce a compound of formula



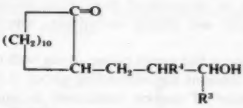
(a)

reducing compound (a) to produce a compound of formula



(b)

saponifying and decarboxylating compound (b) in an alkali solution to produce a compound of formula



(c)

and cyclising compound (c) with an acidic agent to produce compound Vi.

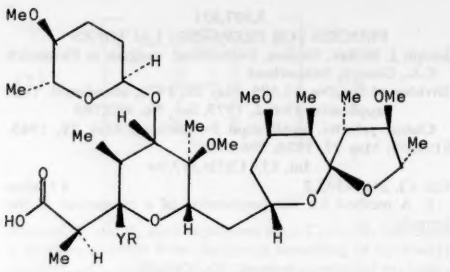
3,907,832

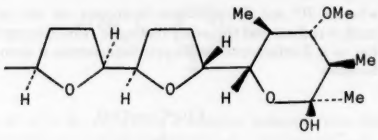
ANTIBIOTIC A204I DERIVATIVES

Robert L. Hamill, New Ross, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 15, 1974, Ser. No. 524,178
Int. Cl.[2] C07D *309/22*
U.S. Cl. 260—345.7 4 Claims

1. The A204I derivative of the formula:





wherein:

Y represents O; and

R represents C_1–C_6-alkyl,

and the physiologically-acceptable cationic salts thereof.

3,907,833

PROCESS FOR OXIDIZING A HYDROCARBON TO MALEIC ANHYDRIDE AND ACETIC ACID

William E. Slinkard, and Michael P. Hughes, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,382

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.8 15 Claims

1. A method for converting a lower alkane having at least four carbon atoms to oxygenated derivatives thereof which comprise acetic acid and maleic anhydride, which method comprises:

passing said alkane in the vapor phase, along with molecular oxygen in an amount not exceeding about 0.5 atom of oxygen per atom of carbon contained in said alkane, through a reaction zone maintained at a temperature between about 200° and about 500°C and containing a bed of particles of a solid catalyst comprising (*a*) vanadium oxide having an oxygen: vanadium atomic ratio between about 2.3:1 and 1.5:1 and (*b*) admixed with said vanadium oxide, an oxide of an additive element which is a member of the group consisting of phosphorus, molybdenum, and mixtures of molybdenum with a member of the group consisting of phosphorus, titanium, and cobalt said catalyst being one which has been prepared by

a. fusing together vanadium pentoxide and an oxide of said additive element;

b. allowing the resulting melt to cool and harden to a friable mass;

c. comminuting said mass to discrete particles; and

d. exposing said particles to a reducing gas at a temperature of about 350° to 450°C. until the atomic ratio of oxygen to vanadium in the vanadium oxide contained therein is about 2.3:1 to 1.5:1.

3,907,834

PROCESS FOR PRODUCING MALEIC ANHYDRIDE

Ernest C. Milberger, Solon; Serge R. Dolhyj, Parma, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sept. 1, 1971, Ser. No. 177,105

Int. Cl. C07c *57/14*

U.S. Cl. 260—346.8 7 Claims

1. A process for producing maleic anhydride comprising contacting a mixture of an unsaturated organic compound selected from the group consisting of n-butylenes, butadiene-1,3, crotonaldehyde and furan and an oxygen-containing gas with a catalyst at a temperature in the range of from about 650°F. to 850°F., under a pressure of from about 1 to 500 psi, and wherein the molar ratio of oxygen to the organic compound is in the range of from about 1:1 to 40:1, respectively, said catalyst having the formula:

$$A_aMo_bSb_cO_d$$

wherein A is a member selected from the group consisting of molybdenum, tungsten, magnesium, aluminum and nickel, and *a* is a member from 0 to 0.2, *b* is a number of from 1 to 9, *c* is a number from 1 to 9, and *d* is a number determined by the valence requirements of the combined elements "and wherein at least some of the molybdenum in the catalyst is at a valence state below +6."

3,907,835

PREPARATION OF MALEIC ANHYDRIDE USING A CATALYST CONTAINING A URANYL ION

Thaddeus P. Kobylinski, Cheswick, and Brian W. Taylor, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 145,518, May 20, 1971, abandoned, and a continuation of Ser. No. 145,549, May 20, 1971, abandoned. This application May 21, 1973, Ser. No. 362,493

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.8 22 Claims

1. In a process for the production of maleic anhydride by catalytic oxidation in the gas phase of an unsaturated material selected from the group consisting of benzene; an ethylenically unsaturated aliphatic hydrocarbon having from 4 to 5 carbon atoms per molecule and from 1 to 2 olefinic double bonds, and wherein said 4 carbon atom hydrocarbon is unbranched; and a monoethylenically unsaturated straight-chain aldehyde having from 4 to 5 carbon atoms per molecule and wherein the olefinic double bond is in the beta position with respect to the carbonyl group with a gas containing free molecular oxygen under oxidation conditions; the improvement which comprises carrying out said oxidation in the contact presence of a catalyst consisting essentially of a uranium salt of a phosphorus oxo acid, said catalyst having a composition within the formula

$$U_xO_yP_zH_n$$

where *x* is an integer from 1 to 3; *y* is an integer from 6 to 16; *z* is an integer from 1 to 4; and *n* can vary from 0 to 2.

3,907,836

PROCESS FOR PURIFYING ANTHRAQUINONE

Jürgen Stepputat, Leverkusen; Gerhard Jung, Opladen, and Hermann Wunderlich, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 12, 1973, Ser. No. 424,233

Claims priority, application Germany, Dec. 23, 1972, 2263247

Int. Cl.[2] C07C *49/68*

U.S. Cl. 260—369 3 Claims

1. Process for purifying anthraquinone which comprises heating crude anthraquinone containing impurities in cyclohexanone or methyl cyclohexanone or in a mixture of cyclohexanone or methyl cyclohexanone and cyclohexanol or methyl cyclohexanol as solvent or solvent mixture up to the boiling point thereof thereby dissolving anthraquinone and

said impurities, crystallizing dissolved anthraquinone by cooling to around 30°C while said impurities remain in solution, thereafter recovering and purifying the crystallized anthraquinone.

3,907,837

PRODUCTION OF AROMATIC KETONES

Franz Effenberger, Stuttgart-Sonnenberg; Karl-Heinz Bantel, Ludwigshafen, and Heinz Eilingsfeld, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

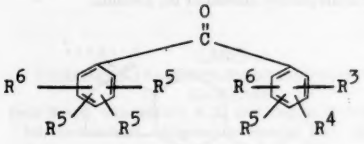
Filed Jan. 9, 1973, Ser. No. 322,206

Claims priority, application Germany, Jan. 12, 1972, 2201208; Nov. 24, 1972, 2257674

Int. Cl.² C07C 49/68, 49/80, 49/84

U.S. Cl. 260—376 8 Claims

1. A compound of the formula



(II)

R^3 is nitro, R^4 is chloro, alkoxy of 1 to 4 carbon atoms alkylmercapto of 1 to 4 carbon atoms, alkyl 1 to 4 carbon atoms or trifluoromethyl R_5 is chloro, alkoxy of 1 to 4 carbon atoms alkylmercapto of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, trifluoromethyl or hydrogen, R_6 is chloro, alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, trifluoromethyl, hydrogen, benzyl or phenoxy.

2. A process for the production of aromatic ketones which comprises: reacting

a. a nuclear-acylatable aromatic compound selected from the group consisting of benzene, naphthalene, toluene, xylene, ethylbenzene, methyl p-tert.-butylbenzene, methylphenylindan, trimethylbenzene, anisol, phenol, o-, m- and p-cresol, diphenylmethane, diphenyl oxide, resorcinol dimethyl ether, anthracene, β-naphthol methyl ether, tetrahydronaphthalene, m-nitrotoluene, m-nitroxylene, m-nitroethylbenzene, 5-nitro-1methyl-3-phenylindan, nitroanisol, nitro resorcinol dimethyl ether, 5-nitro-8-methoxytetrahydronaphthalene, with the proviso that all of said compounds may bear inert substituents selected from the group consisting of lower alkyl, halogen, nitro, hydroxy, alkoxy, cycloalkyl, trifluormethyl, or alkylmercapto with

b. an acyl chloride or acyl anhydride selected from the group consisting of phthalic, trimethylacetyl, acetyl, pivalyl, ethylhexanoyl, benzoyl, p-, m- and p-toluyl, o-, m- and p-nitrobenzoyl, terephthalyl, isophthalyl and 1-nitroanthraquinone-2-carbonyl with the proviso that all of said compounds may bear inert substitutents selected from the group consisting of lower alkyl, halogen, alkoxy, nitro, acyl of 2 to 4 carbon atoms, said reaction being carried out in the presence of a catalytic amount of a benzene- or naphthalenemonsulfonic acid which contains at least two nitro groups and may contain inert substituents selected from the group consisting of trifluoromethyl, cyano, methylsulfonyl, lower alkyl or halogen, said reaction further being carried out at a temperature between room temperature and 300°C.

3,907,838

PROCESS FOR THE PREPARATION OF PURE 1-AMINO ANTHRAQUINONE

Karl-Werner Thiem, Cologne; Wolfgang Auge, Odenthal, and Rutger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 22, 1974, Ser. No. 499,733

Claims priority, application Germany, Aug. 31, 1973, 2343977

Int. Cl.² C07C 97/24

U.S. Cl. 260—378 28 Claims

1. Process for preparing 1-aminoanthraquinone substantially free from diaminoanthraquinone which comprises:

i. nitrating anthraquinone or a mixture which contains anthraquinone with concentrated nitric acid at a temperature of at least −20°C, the mole ratio of nitric acid to anthraquinone being at least 4 : 1;

ii. stopping the reaction when the anthraquinone conversion is at least 50% by cooling the reaction mixture to below 30°C and/or by adjusting the mole fraction of nitric acid to a value of 0.86 or less;

iii. precipitating 1-nitroanthraquinone by adjusting the mole ratio of nitric acid to a value of from 0.07 to 0.4 and/or by cooling the reaction mixture to a temperature of below 20°C;

iv. converting the precipitated 1-nitroanthraquinone into the corresponding 1-aminoanthraquinone; and

v. subjecting the reaction product to vacuum distillation.

3,907,839

PROCESS FOR THE MANUFACTURE OF TETRAARYLOXYBENZOQUINONES

Kurt Burdeska, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

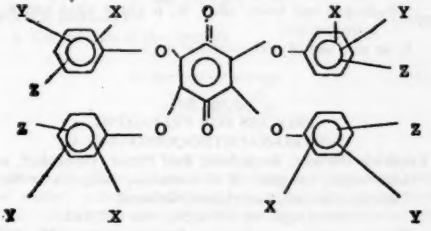
Filed Apr. 30, 1973, Ser. No. 355,981

Claims priority, application Switzerland, May 9, 1972, 6871/72

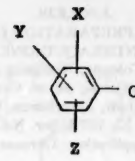
Int. Cl.² C07C 49/64

U.S. Cl. 260—396 R 5 Claims

1. A process for the manufacture of tetraaryloxybenzoquinones of the formula



wherein X and Y denote hydrogen or halogen atoms, alkyl, alkoxy, alkoxyalkyl or alkoxyalkoxy groups, trifluoromethyl, nitro, lower alkylsulphonyl, alkanoyl or alkoxycarbonyl groups, or phenyl, phenoxy or benzoyl groups and Z denotes a hydrogen or halogen atom or a lower alkyl group, said process consisting essentially of reacting at a temperature below 0°C tetrachloro-1,4-benzoquinone with an alkali metal salt of an aromatic hydroxy compound having the formula



in the molar ratio of 1:4 in an aprotic hydrophilic polar organic solvent having a dielectric constant of at least 30 at 25°C.

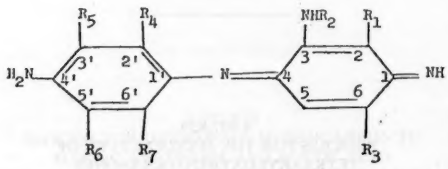
3,907,840

INDAMINES, PROCESS FOR PRODUCING THE SAME AND COMPOSITIONS CONTAINING INDAMINES AND PROCESSES FOR DYEING KERATINOUS FIBERS USING SAID COMPOSITIONS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'oreal, Paris, France

Division of Ser. No. 180,457, Sept. 14, 1971, Pat. No. 3,817,699. This application Jan. 28, 1974, Ser. No. 437,480
Claims priority, application France, Sept. 18, 1970, 70.34042
Int. Cl.[2] C07C *93/14, 103/44*
U.S. Cl. 260—396 N **2 Claims**

1. An indamine selected from the group consisting of:
a. an indamine having the formula



wherein R_1 is selected from the group consisting of hydrogen and lower alkyl, R_2 is selected from the group consisting of hydrogen and acetyl, R_3 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy, R_4 is lower alkoxy, R_5 is selected from the group consisting of hydrogen and lower alkyl, R_6 is lower alkyl and R_7 is hydrogen and
b. an acid salt of said indamine in (a).

3,907,841

PROCESS FOR PREPARING 5-NITRO-NAPHTHOQUINONE-(1,4)

Friedrich Dürholz, Remscheid; Rolf Pütter, Dusseldorf, and Axel Vogel, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 18, 1974, Ser. No. 462,162
Claims priority, application Germany, Apr. 26, 1973, 2321003
Int. Cl.[2] C07C *45/16, 49/66*
U.S. Cl. 260—396 R **11 Claims**

1. Process for preparing 5-nitro-naphthoquinone-(1,4), which comprises reducing 8-nitro-naphthoquinone-(1,4)-oxime-(1) or 5-nitro-naphthoquinone-(1,4)-oxime-(1) or mixtures thereof in an acidic aqueous reaction medium or an acidic water-containing organic solvent reaction medium, said medium containing at least the stoichiometrically required amount of water at a temperature of from −10° to 110°C, by at least the equivalent quantity of sulfur dioxide or phosphorus or mixtures thereof in the presence of hydrogen iodide or compounds that form hydrogen iodide under the reaction conditions, and oxidizing the resulting 8- or 5-nitro-4-aminonaphthol-(1) or the corresponding salts to 5-nitro-naphthoquinone-(1,4) at a temperature of from −10° to 100°C, with or without first isolating the reduction product.

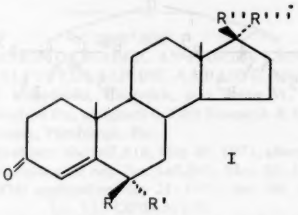
3,907,842

PREPARATION OF 6α AND 6β CARBOXYMETHYLSTEROID CONJUGATES

Charles D. Jones, and Norman R. Mason, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 1, 1974, Ser. No. 456,568
Int. Cl.[2] C07J *11/00*
U.S. Cl. 260—397.1 **5 Claims**

1. A 6-Carboxymethyl steroid of the formula:



I

wherein one of R and R′ is carboxymethyl and the other is hydrogen, wherein R″, taken singly, is hydroxy or acetyl, R‴, taken singly, is hydrogen, and R″ and R‴, taken together with the carbon atom to which they are attached, form a carbonyl.

3,907,843

1α-HYDROXYERGOCALCIFEROL AND PROCESSES FOR PREPARING SAME

Hector F. De Luca, Madison; Heinrich K. Schnoes, Waunakee, and Hing-Yat Lam, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed June 14, 1974, Ser. No. 479,224
Int. Cl.[2] C07J *9/00*
U.S. Cl. 260—397.2 **2 Claims**

1. 1α-Hydroxyergocalciferol.

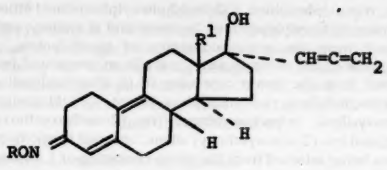
3,907,844

3-OXIMINO-17α-PROPADIENYL-SUBSTITUTED-4,9-GONADIENES

Imre Bacso, Morristown, N.J., and Eugene E. Galantay, Liestal, Switzerland, assignors to Sandoz Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 154,190, June 17, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,566
Int. Cl.[2] C07J *7/00*
U.S. Cl. 260—397.5 **5 Claims**

1. A compound of the formula:



Wherein

R is a hydrogen atom or alkanoyl having from two to four carbon atoms;

R^1 is unbranched alkyl having from one to three carbon atoms.

3,907,845

3-OXIMINO-17α-PROPADIENYL-SUBSTITUTED-4-GONENES

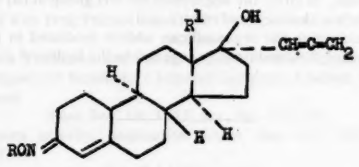
Imre Basco, Morristown, N.J., and Eugene E. Galantay, Liestal, Switzerland, assignors to Sandoz Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 154,190, June 17, 1971. This application Sept. 19, 1973, Ser. No. 398,584

Int. Cl.[2] C07J *43/00*

U.S. Cl. 260—397.5 **6 Claims**

1. A compound of the formula:



wherein

R is a hydrogen atom or alkanoyl having from two to four carbon atoms; and

R^1 is an unbranched alkyl having from one to three carbon atoms.

3,907,846

PREPARATION OF SUBSTITUTED DECENOIC ACIDS

William Dawson, Camberley; Michael John Foulis, Binfield; Norman James Albert Gutteridge, Owlsmoor, and Colin William Smith, Bracknell, all of England, assignors to Lilly Industries, Ltd., London, England

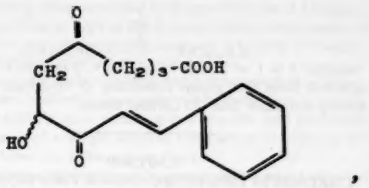
Filed Apr. 10, 1974, Ser. No. 459,830

Claims priority, application United Kingdom, Apr. 12, 1973, 17734/73

Int. Cl.[2] C11C *3/02*

U.S. Cl. 260—408 **7 Claims**

1. A compound selected from the group consisting of 7-hydroxy-5,8-dioxo-10-phenyldec-9-enoic acid of the formula



its alkali metal salt,

its C_{1-4} alkyl ester, and

its C_{1-4} haloalkyl ester.

3,907,847

COMPOUND AND METHOD

Kestutis A. Keblys, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 32,347, April 27, 1970, abandoned. This application July 25, 1973, Ser. No. 382,377

Int. Cl. C07f *15/00*

U.S. Cl. 260—429 R **17 Claims**

1. A method for preparing compounds having the formula $HRh(CO)[L(OR_1)(OR_2)(OR_3)]_3$ wherein L is selected from P, As, and Sb, and R_1, R_2, and R_3 are independently selected from the groups consisting of alkyl and aryl, said groups having from one to about 20 carbon atoms, which comprises reacting

a. a compound having the formula $XRhCO[L(OR_1)(OR_2)(OR_3)]_2$ wherein X is a halogen and L, R_1, R_2, and R_3 are as defined above,

b. a substantially stoichiometric amount based on compound (a) of a compound having the formula $L(OR_1)(OR_2)(OR_3)$ wherein L, R_1, R_2, and R_3 are as defined above, and

c. a metal borohydride in a C_1—C_6 alkanol reaction medium at temperatures ranging from about −20°C. to above 30°C.

3,907,848

ORGANIC TITANIUM AND SILICON CONTAINING COMPOUNDS

Ian Ferguson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

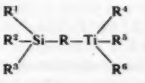
Filed July 20, 1973, Ser. No. 381,225

Claims priority, application United Kingdom, July 24, 1972, 34477/72

Int. Cl. C07f *7/28*

U.S. Cl. 260—429.5 **4 Claims**

1. Compounds of the formula



wherein R^1, R^2 and R^3 are selected from the group consisting of methyl, polydimethylsiloxanoxy, polymethyl (methoxyethoxy)siloxanoxy, ethoxy, β-methoxyethoxy, isopropoxy and N,N-diethylamino groups;

R^4 and R^5 are selected from the group consisting of 4-keto-pent-2-one-2-oxy, ethylacetylacetoxy and aminoaliphatic groups;

R^6 is alkoxy; and

R is selected from the group consisting of $—O—(CH_2)_n—O$ wherein n is an integer not less than 3, $—(CH_2)_m—O—$ wherein M is an integer not less than 2, $—(CH_2)_3—NR''—$ wherein R'' is selected from the group consisting of hydrogen and lower alkyl, and

$$-(CH_2)_bCHR'''-\overset{O}{\overset{\|}{C}}-O-[(CH_2)_cO]_d$$

wherein *b* is 1 or 2, *c* is 1, 2, 3 or 4, *d* is 0 or 1 and R''' is selected from the group consisting of hydrogen and alkyl having not more than 20 carbon atoms.

3,907,849

CHROMIUM TRIS-DIORGANO-ORTHOPHOSPHATES AND THEIR PREPARATION

Jeffrey G. Meyer, Adrian, Mich., assignor to Anderson Development Company, Adrian, Mich.

Filed Dec. 29, 1972, Ser. No. 319,621
Int. Cl.[2] C07F 11/00
U.S. Cl. 260—438.5 R **7 Claims**

1. A compound soluble in halogenoalkane solvents and having the formula Cr [OP (O) $(OR)_2]_3$ in which each R is selected from the class consisting of alkyl, cycloalkyl, alkoxyalkyl, chlorinated derivatives thereof and brominated derivatives thereof, said alkyl and cycloalkyl containing one to eight carbon atoms and said alkoxyalkyl containing three to six carbon atoms.

2. The method consisting essentially of (1) heating a compound of the formula M' [OP (O) $(OR)_2]_n$ in which M' in an alkali metal or alkaline earth metal, *n* is the valence of that metal and each R is selected from the class consisting of alkyl, cycloalkyl, alkoxyalkyl, chlorinated derivatives thereof and brominated derivatives thereof, said alkyl and cycloalkyl containing one to eight carbon atoms and said alkoxyalkyl containing three to six carbon atoms, with a compound of the formula M_aZ_b in which each M is trivalent chromium, each Z is a non-reducing substituent selected from the group consisting of anions of non-metallic inorganic acids, the hydroxyl group and organic carboxylic groups of from one to about 18 carbon atoms, *a* is 1 or 2, *b* is 1 or 3 and the values of *a* and *b* depend on the valence of Z, said heating being at a temperature between about 0° and 150°C. but below the decomposition temperatures of the reactants and at a pressure and for a time sufficient to cause a reaction, and (2) separating from the reaction mixture a product consisting essentially of a compound soluble in halogeno-alkane solvents and having the formula Cr [OP (O) $(OR)_2]_3$ by extraction with a solvent for said product but not for the resulting M'-containing by-product.

3,907,850

METHOD OF PRODUCING UNSATURATED ORGANOSILICON COMPOUNDS

Martin Capka; Petr Svoboda; Jiri Hetflejs; Vladimir Bazant; Petr Bazant; Vera Bazantova, and Jan Bazant, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Nov. 23, 1973, Ser. No. 418,293
Claims priority, application Czechoslovakia, Nov. 23, 1973, 7972-73
Int. Cl.[2] C07F 7/02, 7/12, 7/18
U.S. Cl. 260—448.2 E **2 Claims**

1. A process for the production of unsaturated organosilicon compounds comprising reacting together in the presence of a nickel compound a silicon compound and a dienic hydrocarbon, said nickel compound being bis (1,5 cyclooctadiene) nickel, tetracarbonylnickel, bis (triphenylphosphine) dicarbonylnickel, and tetrakis (triphenylphosphine) nickel, a nickel complex of the formula L_2NiX_2, where L_2 is chosen from the group consisting of two molecules of triphenylphosphine and one molecule of 1,2-bis (diphenylphosphine)ethane, and X is chosen from the group consisting of chlorine, bromine and iodine atom, a cyano group, and a nickel salt selected from the group consisting of a nickel chloride, nickel bromide, nickel iodide, nickel nitrate, nickel lactate and nickel acetylacetonate, coordinately bound to a tertiary phosphine selected from the group consisting of triphenylphosphine, tributylphosphine, 1,2-bis (diphenylphosphino) ethane, 1,2 -bis (diphenylphosphino) benzene and a tertiary amine selected from the group consisting of triethylamine, tripropylamine, and tributylamine, said silicon compound being selected from the group consisting of dichloromethylsilane, dichloroethylsilane, dichlorophenylsilane, trichlorosilane, triethoxysilane, tripropoxysilane, tris (2-methoxyethoxysilane), and tris (2-ethoxyethoxy) silane, and said dienic hydrocarbon being selected from the group consisting of 1,3-butadiene, isoprene, and piperylene.

3,907,851

NOVEL PROCESS FOR PRODUCING ORGANOSILICON HYDROXY COMPOUNDS AND NOVEL ORGANOSILICON ADDUCTS

Robert P. Boersma, and Vincent T. Chuang, both of Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 129,561, March 30, 1971, Pat. No. 3,794,673. This application Nov. 23, 1973, Ser. No. 418,420
Int. Cl.[2] C07F 7/08, 7/18
U.S. Cl. 260—448.2 B **9 Claims**

1. A process which comprises

I. reacting (a) a silicon compound containing an SiH group with (b) a reaction product formed by reacting (i) an olefinically unsaturated compound containing a hydroxyl group selected from the group consisting of alkenols, alkenyl substituted phenols and alkenyl carboxylic acids with (ii), an enol ether by the addition of the hydroxyl group of (i) to the olefinic double bond of (ii), the reaction of (a) and (b) being conducted in the presence of (c) a catalyst for the addition of SiH to the olefinic double bonds, to effect the addition of the SiH group of (a) to the olefinic double bond of (b), and

II. subjecting the organosilicon adduct produced in (I) to hydrolytic conditions to regenerate the hydroxyl group.

3,907,852

SILYLHYDROCARBYL PHOSPHINES AND RELATED COMPOUNDS

Alexis A. Oswald, Mountainside, and Lawrence L. Murrell, Elizabeth, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 23, 1972, Ser. No. 265,507
Int. Cl.[2] C07F 7/02, 7/08, 7/10, 7/12
U.S. Cl. 260—448.2 N **24 Claims**

1. A method for the preparation of silylalkyl phosphines comprising the step of selectively reacting phosphines of the formula

$$R'_{3-x}PH_x$$

wherein R' is C_1 to C_4 alkyl, cyclohexyl and phenyl and *x* is an integer ranging from 1 to 3, with ω-alkenyl silanes of the formula:

$$R_{4-y}Si[CH_2)_lCH{=}CH_2]_y$$

wherein R is chlorine, C_1 to C_6 hydrocarbyl providing that at least one of the R groups is chlorine; *y* is 1 or 2 and *l* is 3 to 32, at temperatures between −100° and +16°C with radiation initiation to a phosphine conversion in excess of 50% to yield the corresponding free radical adducts of anti-Markovnikov orientation.

12. Compounds of the formula:

$$(R'_{3-x}P)_x[(CH_2)_m]_ySiR_{4-y}$$

wherein R is chloro, and C_{1-6} hydrocarbyl provided that at least one of the groups is chloro; *m* is 5 to 30, *z* is 1 to 3; *y* is 1 or 2; *x* is 1 to 3; R' is C_1 to C_4 alkyl, cyclohexyl and phenyl.

3,907,853

PERFLUOROALKANESULFONATE ESTER HERBICIDES

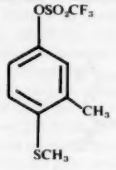
Tomas L. Fridinger, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 27,998, April 13, 1970, abandoned. This application Mar. 1, 1973, Ser. No. 336,956

Int. Cl.[2] C07C *143/68*

U.S. Cl. 260—456 R 4 Claims

1. The compound of the formula:



3,907,854

DIALKYL THIONOCARBAMATE METHOD

Franklin Anderson Bolth, Baltimore, Md.; Ronald David Crozier, Bedford, N.Y., and Lawrence Evans Strow, Baltimore, Md., assignors to Minerec Corporation, New York, N.Y.

Filed July 13, 1973, Ser. No. 379,114

Int. Cl.[2] C07C *155/02*

U.S. Cl. 260—455 A 13 Claims

1. In a process for the production of dialkyl thionocarbamates by reaction of an alkyl amine containing 1 to 6 carbon atoms with a lower alkyl, alkali metal xanthate, the improvement comprising carrying out said reaction in the presence of palladium ions.

3,907,855

PROCESS FOR PRODUCING ACTIVE ESTERS OF AMINO ACIDS

Noboru Yamazaki, and Fukuji Higashi, both of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 10, 1973, Ser. No. 423,196

Claims priority, application Japan, Dec. 13, 1972, 47-125415

Int. Cl.[2] C07C *153/09*

U.S. Cl. 260—455 R 4 Claims

1. A process for producing an active ester of amino acid having one or more protected amino groups which comprises reacting an amino acid having one or more protected amino groups with a compound having at least one hydroxyl or mercapto group at a temperature of 20° to 200°C. in the presence of 1–10 moles of phosphorous acid ester and at least equimolar tertiary amine per mole of one of the starting materials.

3,907,856

BIODEGRADABLE SULFATE DETERGENTS

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 277,836, Aug. 3, 1972, Pat. No. 3,867,421. This application Nov. 4, 1974, Ser. No. 520,695

Int. Cl.[2] C07C *141/12*

U.S. Cl. 260—457 8 Claims

1. A process for the preparation of a biodegradable detergent which comprises the steps of:

a. condensing butadiene with allyl alcohol in a Diels-Alder reaction at a temperature in the range of from about 50° to about 190° C. and a pressure of from atmospheric to about 100 atmospheres to form hydroxymethylcyclohexene;

b. ring alkylating said hydroxymethylcyclohexene with a 1-alkene in the presence of an organic peroxy free-radical generating compound and hydrogen chloride at a temperature at least as high as the decomposition temperature of said free-radical generating compound to form an n-alkyl-substituted hydroxymethylcyclohexene;

c. sulfating said n-alkyl-substituted hydroxymethylcyclohexene with a sulfating agent selected from the group consisting of sulfuric acid, oleum, sulfur trioxide, and chlorosulfonic acid at a temperature of from about 0° to about 60° C. to form the sulfate ester thereof;

d. neutralizing said ester with a neutralizing agent selected from the group consisting of alkali metal base, alkaline earth metal base, ammonia, ammonium hydroxide, lower alkyl- and alkanol amine and benzyl amine to form the resultant biodegradable detergent; and

e. recovering the same.

3,907,857

BORIC ACID ESTER OF 2,2,2-TRIS-(BROMOMETHYL)-THANOL

Horst Mayerhoefer, Therwilerstrasse 43a, 4104 oberwil, Basel-Land; Wolfgang Mueller, Bettenstrasse 22, 4122 Neuallschwil, Basel-Land, and Urs Sollberger, Liestalerstrasse 35, 4414 Fuilinsdorf, Basel-Land, all of Switzerland

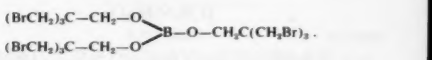
Filed July 31, 1972, Ser. No. 276,395

Claims priority, application Switzerland, Aug. 25, 1971, 11525/71; Dec. 17, 1971, 18432/71

Int. Cl.[2] C07F *5/04*

U.S. Cl. 260—462 R 1 Claim

1. The compound of the formula



3,907,858

PROCESS OF MANUFACTURING NITRILOTRIACETONITRILE

Kenneth E. Davis, Ossining, and Kyung S. Shim, Dobbs Ferry, both of N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Continuation of Ser. No. 678,971, Oct. 30, 1967, abandoned. This application Nov. 8, 1971, Ser. No. 198,027

Int. Cl.[2] C07C *120/00*

U.S. Cl. 260—465.5 A 7 Claims

1. A continuous process for manufacturing nitrilotriacetonitrile which comprises: continuously bringing into reactive contact for a period of from about one to about 30 minutes, under superatmospheric pressure, at a temperature between about 120°C. and the temperature at which the autogenous pressure is about 100 pounds per square inch gauge, in an aqueous liquid mixture, at a pH maintained below 5 by addition of a mineral acid, hexamethylenetetramine or equivalent quantities of ammonia and formaldehyde with formaldehyde and hydrogen cyanide, said hexamethylenetetramine or equivalent quantities of ammonia and formaldehyde, hydrogen cyanide and formaldehyde being provided in amounts which are stoichiometrically necessary to convert the ammonia to nitrilotriacetonitrile, to form a liquid reaction mixture containing nitrilotriacetonitrile, continuously conveying the liquid reaction mixture containing the nitrilotriacetonitrile product to a quenching means to rapidly cool said aqueous liquid reaction mixture to at least below 90°C. to precipitate the nitrilotriacetonitrile produce and continuously recovering the nitrilotriacetonitrile product.

3,907,859
COPRODUCTION OF ACRYLONITRILE AND ACRYLIC ACID

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Arthur F. Miller, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 25, 1972, Ser. No. 300,650

Int. Cl.² C07C *120/14, 57/04, 51/32*

U.S. Cl. 260—465.3 **6 Claims**

1. The process for preparing acrylonitrile and acrylic acid or methacrylonitrile and methacrylic acid comprising reacting an olefin selected from propylene or isobutylene, about 0.5 to about 4 moles of molecular oxygen per mole of olefin and about 0.1 to about 0.9 moles of ammonia per mole of olefin at a temperature between about 300° to about 600°C in the presence of at least two different catalysts, the first of which is an ammoxidation catalyst consisting essentially of a catalyst of the formula:

$$A_aB_bFe_cBi_dC_eMo_fO_x$$

wherein

A is an alkali metal, alkaline earth metal, Tl, In, rare earth metal or mixture thereof,

B is Ni, Co, Mg or a mixture thereof and

C is phosphorus, arsenic, boron or antimony,

and wherein

a and *e* are independently 0–3,

b is 0 to 20,

c and *d* are independently 0.1 to 10,

f is about 8 to about 16 and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

and the second of which is an oxidation catalyst consisting essentially of a catalyst of the formula:

$$D_gW_hV_iMo_jO_x$$

wherein

D is an element selected from the group of alkali metals, alkaline earth metals, Cr, Mn, Fe, Co, Ni, Cu, Ag, Au, Zn, Cd, Hg, Sn, Pb, Sb, Bi, P, As or mixture thereof,

and wherein

g is 0 to about 12,

h is 0.1 to about 6,

i is 0.1 to about 12,

j is about 8 to about 16 and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

3,907,860
ACYCLIC NITRILES

Alec Mee, Norton, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 4, 1974, Ser. No. 447,830

Claims priority, application United Kingdom, Mar. 23, 1973, 14092/73

Int. Cl.² C07C *120/00, 120/14, 121/26*

U.S. Cl. 260—465.3 **6 Claims**

1. A process for the manufacture of adiponitrile and mixtures thereof with ω-hydroxycaproniţrile which comprises heating a reactant selected from the group consisting of cyclohexane, cyclohexanol, cyclohexanone or mixtures thereof in the liquid phase at 90° to 250°C at a pressure sufficient to maintain said reactant in the liquid phase while passing ammonia and oxygen, the rate of passage of ammonia being 10 to 500 times that of oxygen on a molar basis, in the presence of a sufficient amount of catalyst to obtain adiponitrile, said catalyst being selected from the group consisting of a copper, cobalt, vanadium or manganese halide or salt of an organic carboxylic acid which is soluble in said reactant and present in an amount sufficient to obtain adiponitrile.

3,907,861
CYANOPHENOXYACETONITRILES

Reinhold Puttner, and Friedrich Arndt, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

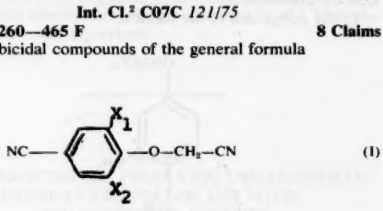
Filed June 26, 1973, Ser. No. 373,864

Claims priority, application Germany, July 13, 1972, 2234817

Int. Cl.² C07C *121/75*

U.S. Cl. 260—465 F **8 Claims**

1. Herbicidal compounds of the general formula



(I)

in which X_1 and X_2 are identical or different and represent halogen.

3,907,862
HINDERED PHENOLIC CYANO COMPOUNDS

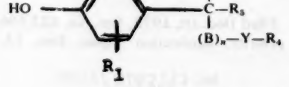
Martin Dexter, Briarcliff Manor, and John D. Spivack, Spring Valley, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 616,801, Feb. 17, 1967, Pat. No. 3,721,704. This application Nov. 6, 1972, Ser. No. 303,913

Int. Cl.² C07C *121/75*

U.S. Cl. 260—465 D **3 Claims**

1. Compounds of the formula



wherein

R_1 and R_2 are alkyl of 1 to 8 carbon atoms;

Y is oxycarbonyl group;

R_3 and R_4 are alkyl groups of 1 to 40 carbon atoms;

R_5 is cyano group;

B is alkylene having 2 carbon atoms, and

n is zero or one.

3,907,863
PROCESS FOR MAKING POLYESTER POLYOLS HAVING A LOW ACID NUMBER

Harro Voss, Ludwigshafen, Germany, assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 14, 1974, Ser. No. 450,986

Claims priority, application Germany, Mar. 31, 1973, 2316293

Int. Cl.² C07C *69/44, 69/74, 69/80*

U.S. Cl. 260—468 K **10 Claims**

1. In a process for the preparation of polyester polyols by the melt-condensation esterification of a polyhydric alchol selected from the group consisting of polyether diols and polyester diols and a polycarboxylic acid at a temperature from about 150°to about 300°C wherein residual amounts of active catalyst is undesirable, the improvement for producing

such polyols having an acid number less than one which comprises:

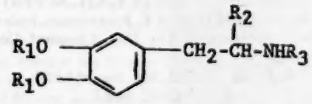
continuing the esterification until the product has an acid number of 480 or less and then adding to the esterification mixture of reactants and product a distillable alcohol in an amount of 0.1 to 1.4 moles per mole of carboxylic acid charged and continuing the esterification while simultaneously distilling off the excess distillable alcohol until the esterification is completed, said distillable alcohol being selected from the group consisting of (a) monohydroxy normal, branched or cyclo alkyl, alkene or alkine alcohols containing from 1 to 6 carbon atoms, (b) aromatic monohydroxy alcohols, (c) dihydroxy normal, branched or cyclo alkyl, alkene or alkine alcohols containing from 2 to 8 carbon atoms, dialkyl ether glycols containing from 2 to 8 carbon atoms in each alkyl group and mixtures thereof, said polyether and polyester diols having a molecular weight from 200 to 4500, said distillable alcohol being said monohydroxy alcohols when said acid number is less than 60 prior to said distillable alcohol addition and dialcohols or mixtures of di- and monoalcohols when said acid number is greater than 60.

3,907,864
AMINO ACID ESTERS AND AMIDES OF DISUBSTITUTED PHENETHYLAMINES

John Hans Biel, Lake Bluff Village, Ill., and Irwin L. Klundt, Brookfield, Wis., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 15, 1973, Ser. No. 332,980The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.
Int. Cl.² C07C *125/06*
U.S. Cl. 260—471 C **10 Claims**

1. A compound of the formula



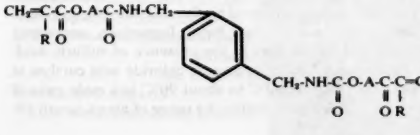
wherein each R_1 is hydrogen or benzyl; R_2 is hydrogen or loweralkyl and R_3 is derived from an amino acid selected from the group consisting of β-alanine, α-methylalanine, phenylalanine, 3,4-dihydroxyphenylalanine, 4-chlorophenylalanine, glycine, tyrosine, valine, leucine, iso-leucine, serine, threonine, aspartic acid, glutamine, arginine, lysine, γ-aminobutyric acid, alanine, sarcosine or R_3 is one of the above amino acids protected by either carbobenzyloxy or t-butyloxycarbonyl; and the pharmaceutically acceptable acid addition salts thereof.

3,907,865
PHOTOPOLYMERIZABLE VINYLURETHANE MONOMER

Nobuyoshi Miyata, and Hiroyuki Nakayama, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed June 20, 1973, Ser. No. 371,579
Int. Cl.² C07C *125/06*
U.S. Cl. 260—471 C **34 Claims**

1. A divinylurethane monomer having the chemical formula



in which

R represents a hydrogen atom or a methyl group and

A represents an alkyleneoxy group or a polyalkyleneoxy group of the formula

where

R is a hydrogen atom or a methyl group and

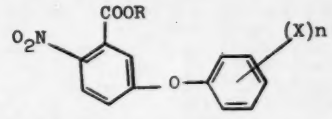
m is a positive integer of 1 to 11.

3,907,866
HIGHER HALOPHENOXY BENZOIC ACID ESTERS

Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed June 7, 1974, Ser. No. 477,233
Int. Cl.² C07C *79/46*
U.S. Cl. 260—471 R **7 Claims**

1. A compound having the formula:



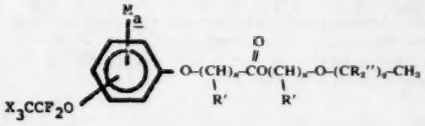
wherein X is halogen, *n*is 1 to 3, and R is alkyl (C_4–C_{12}), cycloalkyl (C_3–C_8), or unsaturated hydrocarbyl (C_3–C_{10}).

3,907,867
SUBSTITUTED PHENOXYL-ACETATES AND DERIVATIVES THEREOF

Fred Y. Edamura, Concord, Calif.; Lennon H. McKendry, and Eric R. Larsen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 299,287, Oct. 20, 1972, Pat. No. 3,829,489, which is a continuation-in-part of Ser. No. 111,688, Feb. 1, 1971, Pat. No. 3,709,926. This application Feb. 20, 1974, Ser. No. 444,080
Int. Cl.² C07C *69/76*
U.S. Cl. 260—473 G **2 Claims**

1. A compound corresponding to the formula:



wherein

each X independently represents hydrogen, bromo, chloro or fluoro, with the proviso that at least one X is always bromo, chloro or fluoro;

each M independently represents bromo, chloro, fluoro, iodo or loweralkyl containing from 1 to about 4 carbon atoms, both inclusive;

a represents an integer of from 0 to 3, both inclusive;

each *n* independently represents an integer of from 1 to 6, both inclusive;

q represents an integer of from 1 to 4, both inclusive;

R′ represents hydrogen or loweralkyl containing from 1 to about 4 carbon atoms, both inclusive, with the proviso

that when n is greater than 1, only one R′ can be loweralkyl; and

each R″ independently represents hydrogen or loweralkyl containing from 1 to about 4 carbon atoms, with the proviso that when q is greater than 1, only two R″ moieties can be loweralkyl.

3,907,868

POLYESTER WASTE RECOVERY

Robert Marion Currie; Shubert Gernt Measamer, both of Circleville, Ohio, and Donald Nelson Miller, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1974, Ser. No. 442,910

Int. Cl.² C07C *69/82*

U.S. Cl. 260—475 D **17 Claims**

1. In a process for the recovery of dimethyl terephthalate from polyethylene terephthalate waste by:

1. dissolving and reacting the waste with ethylene glycol to prepare liquid reaction solution,
2. contacting the liquid reaction solution with an excess of methanol and an ester exchange catalyst at an elevated temperature and superatmospheric pressure to prepare dimethyl terephthalate, and
3. recovering dimethyl terephthalate from the liquid reaction solution,

the improvement wherein the process is continuous, in step (2) the weight ratio of methanol to liquid reaction solution is at least about 2 to 1 and the elevated temperature is about 180° to 300°C., and wherein undesired solids are eliminated prior to recovery of the dimethyl terephthalate by:

a. introducing a sequestering agent to the hot liquid reaction solution of step (2), before release of the superatmospheric pressure, to deactivate the ester exchange catalyst,
b. distilling excess methanol from the hot liquid reaction solution, and
c. removing solids from the hot liquid reaction solution at a temperature above about 125°C.

3,907,869

METHOD OF PRODUCING CALCIUM PANGAMATE

Vasily Nikolaevich Bukin, Leninsky prospekt, 13, kv. 74, and Irina Nikolaevna Garkina, Michurinsky prospekt, 2, korpus 1, kv. 96, both of Moscow, U.S.S.R.

Filed Dec. 21, 1971, Ser. No. 210,588

Int. Cl.² C07C *101/06*

U.S. Cl. 260—482 R **2 Claims**

1. A method of producing calcium pangamate, comprising esterifying gluconic acid or the lactone thereof with dimethylglycine hydrochloride in the presence of sulfuric acid in an aqueous medium at a temperature ranging from 30° to 70°C, concentrating the esterification product and neutralizing said product with calcium carbonate.

3,907,870

POLYMERIZABLE EMULSIFYING AGENT

Ko Kozuka, Takasago; Shigeru Kobayashi, Akashi; Akira Watanabe, Kobe; Yoshio Iki, Akashi, and Masaaki Yokoe, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 20, 1973, Ser. No. 399,128

Claims priority, application Japan, Sept. 20, 1972, 47-94797

Int. Cl.² C07C *69/60*

U.S. Cl. 260—485 J **4 Claims**

1. A compound having the following general formula:

wherein R is alkyl group having 6 to 22 carbon atoms, M is H, Li, Na, K or NH_4 and n is an integer of 2 to 4, inclusive.

3,907,871

EXTRACT CONTAINING PROSTAGLANDINS

William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 159,525, July 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 71,392, Sept. 11, 1970, abandoned. This application Oct. 25, 1973, Ser. No. 409,692

Int. Cl.² C07C *69/74, 67/48*

U.S. Cl. 260—488 R **8 Claims**

1. A composition comprising those substances obtained by extracting previously frozen colonies or colony pieces of the marine invertebrate *Plexaura homomalla* (Esper), 1792, forma R or forma S, with a neutral organic liquid selected from the class consisting of hydrocarbons, halogenated hydrocarbons, lower alkanols, ketones, and esters, having a boiling point below about 100° C., and effective to extract 15β-PGA_2 acetate methyl ester from forma R or PGA_2 acetate methyl ester from forma S, said colonies or colony pieces having been frozen within 1 hour after removal from their growing site, and thereafter maintained in a frozen state until the time for extraction.

3,907,872

ALTERNATING COPOLYMERS OF TRICHLOROETHYLENE IN VINYL ACETATE

Dietrich H. Heinert, and William E. Broxterman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 1, 1973, Ser. No. 384,660

Int. Cl.² C07C *69/63*

U.S. Cl. 260—488 J **2 Claims**

1. A copolymer consisting essentially of from about 57 to about 66.7 mole percent of trichloroethylene and from about 33.3 to about 43 mole percent of vinyl acetate in which from 0 to 100 percent of the copolymerized vinyl acetate is hydrolyzed to vinyl alcohol or hydrolyzed and then reesterified with a carboxylic acid, selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, itaconic acid, maleic acid, citraconic acid, aconitic acid, propionic acid, butanoic acid, lactic acid, hydroacrylic acid, 3-amino-propanoic acid and 6-aminohexanoic acid, said copolymer having a molecular weight as determined by boiling point elevation in the range from about 300 to about 6,000.

3,907,873

NOVEL FRAGRANCE MATERIALS AND PROCESS

Christian F. Wight, Mount Kisco, N.Y., and John B. Hall, Rumson, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation of Ser. No. 37,333, May 14, 1970, abandoned. This application May 29, 1973, Ser. No. 364,918

Int. Cl.² C07C *67/04, 69/07*

U.S. Cl. 260—489 **5 Claims**

1. A product which is formed by the reaction of longifolene and formic acid, the product being formed by contacting longifolene and formic acid in the presence of sulfuric acid, boron trifluoride etherate, or stannic chloride acid catalyst at a temperature of about 30°C to about 90°C in a mole ratio of formic acid to longifolene within the range of about two to 10.

3,907,874

VICINAL GLYCOL ESTER PREPARATION PROCESS

Robert Joseph Harvey, Teaneck; John Kollar, Wyckoff, both of N.J., and John Philip Schmidt, New York, N.Y., assignors to Halcon International, Inc., New York, N.Y.

Filed Aug. 9, 1972, Ser. No. 278,903
Int. Cl.[2] C07C *67/08, 69/16*
U.S. Cl. 260—497 R 26 Claims

1. In the process for the continuous preparation of C_1–C_3 hydrocarbyl aliphatic carboxylic acid esters of C_2–C_3 vicinal glycols by the catalytic liquid phase reaction of (a) an olefin corresponding in structure to the glycol moiety of said ester and selected from the group consisting of ethylene and propylene, (b) molecular oxygen and (c) a monobasic aliphatic hydrocarbyl carboxylic acid of 1-5 carbon atoms corresponding in structure to the acyl moiety of said ester; the catalyst for said reaction being a tellurium or selenium cation in combination with a halide anion, the combination being selected from the group consisting of tellurium cation plus bromide anion, selenium cation plus bromide anion and selenium cation plus chloride anion; said reaction being carried out within an oxidation zone containing a liquid phase reaction medium comprising reactants, catalyst and reaction products including the carboxylic acid esters and halogenated byproducts; wherein reactants are continuously introduced into the oxidation zone and at least a portion of the liquid phase reaction medium is continuously withdrawn, the withdrawn portion of the reaction medium being processed to recover carboxylic acid ester product, unconverted reactants and halogenated by-products and wherein the recovered unconverted reactants are recycled to the oxidation zone; the improvement which comprises: minimizing selectivity losses while maximizing rate of formation of carboxylic acid ester product by recycling at least a predominant portion of the halogenated byproducts to the oxidation zone to provide a substantial portion of the halogen component of the catalyst system while conducting the reaction at a temperature exceeding 150°C. but not in excess of about 250°C. in the presence of at least 0.05 equivalent of a basicity control cation per gram-atom of halogen anion in the liquid phase reaction medium, said basicity control cation having, when in the form of a salt with the halide corresponding to that of the catalyst system, an activity coefficient of at least 0.40 and said basicity control cation not having a pH-reducing effect when in the form of a salt with the carboxylic acid reactant, the basicity control cation being selected from at least one member of the group consisting of the alkaline earth metals, the lanthanides, scandium, yttrium, iron, cobalt, nickel, zinc, bismuth, chromium, manganese, molybdenum, copper, arsenic, antimony, alkyl amines, alkyl quaternary ammonium salts, phenyl amines, pyrrole, pyridine, indole and alkyl-substituted pyrroles, pyridines and indoles.

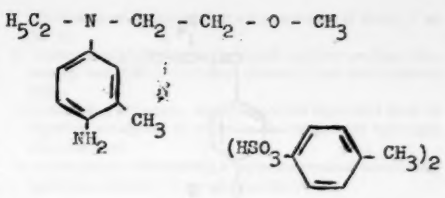
3,907,875

DI-P-TOLUENESULFONIC ACID SALT OF N-ETHYL-N-ETHOXYETHYL-3-METHYL 1,4 BENZENEDIAMINE

Dietmar Schellenberg, and Richard L. Bent, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 204,725, Dec. 3, 1971, Pat. No. 3,816,134. This application Jan. 23, 1974, Ser. No. 435,813The portion of the term of this patent subsequent to Apr. 25, 1989, has been disclaimed.
Int. Cl.[2] C07C *93/14*
U.S. Cl. 260—501.19 1 Claim

1. A compound of the formula



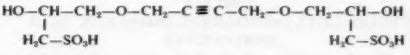
3,907,876

SYMMETRICAL ACETYLENIC SULFO-OXYGEN COMPOUNDS

Sidney C. Beach, and Bernard P. Martin, both of Cleveland, Ohio, assignors to McGean Chemical Co., Inc., Cleveland, Ohio

Division of Ser. No. 268,039, June 30, 1972, Pat. No. 3,860,638, which is a division of Ser. No. 145,474, May 20, 1971, Pat. No. 3,699,016, which is a continuation-in-part of Ser. Nos. 592,742, Nov. 8, 1966, abandoned, and Ser. No. 860,008, Sept. 22, 1969, abandoned. This application May 3, 1974, Ser. No. 466,542
Int. Cl.[2] C07C *143/16*
U.S. Cl. 260—513 R 1 Claim

1. A composition of matter having the following structural formula,



or the alkali metal salts thereof.

3,907,877

PRECIPITATION OF SODIUM BENZOATE

Carole Anne Tedball, Sarnia, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 27, 1970, Ser. No. 93,484
Int. Cl. C07c *63/08*
U.S. Cl. 260—515 R 7 Claims

1. In a process for preparing sodium benzoate from benzoic acid wherein the benzoic acid is obtained by the heavy metal oxidation of toluene and the benzoic acid is present in solution, the improvement comprising adding a sodium alkoxide to the solution to produce a slurry containing solid sodium benzoate in granular form and filtering the slurry to recover the granular sodium benzoate.

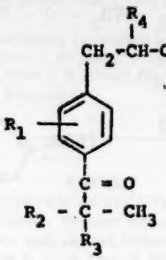
3,907,878

ACYL SUBSTITUTED PHENYL PROPIONIC ACIDS

William J. Houlihan, and Jeffrey Nadelson, both of Mountain Lakes, N.J., assignors to Sandoz Inc., East Hanover, N.J.

Filed Feb. 20, 1973, Ser. No. 333,893
Int. Cl.[2] C07C *65/20*
U.S. Cl. 260—515 R 7 Claims

1. A compound of the formula



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36, or straight chain lower alkoxy, and

R_2 and R_3 each independently represent lower alkyl having 1 to 2 carbon atoms, and

R_4 represents hydrogen, lower alkyl having 1 to 4 carbon atoms, except t-butyl, unsubstituted benzyl or allyl, pharmaceutically acceptable salt thereof.

3,907,879

CYCLOALKYLAMINOARYLCARBOXYLIC ACID DERIVATIVES

Masuo Murakami, Tokyo; Kazuo Kubo, Urawa; Hideki Arima, Tokyo, and Kenji Sano, Omiya, all of Japan, assignors to Yamanouchi Parmaceutical Co., Ltd., Tokyo, Japan

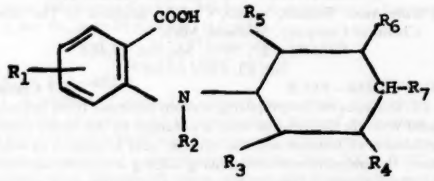
Filed Nov. 2, 1972, Ser. No. 303,045

Claims priority, application Japan, Nov. 25, 1971, 46-94656; Nov. 27, 1971, 46-95428; Dec. 10, 1971, 46-100050; July 31, 1972, 47-76647; Aug. 31, 1972, 47-87307

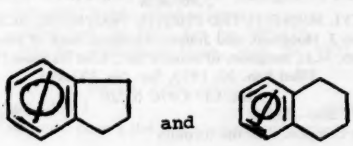
Int. Cl.² C07C *101/54*

U.S. Cl. 260—518 R **4 Claims**

1. A compound of the formula



wherein R_1 is a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy; R_2 is a member selected from the group consisting of hydrogen, lower alkyl, benzyl or phenethyl; R_3, R_4, R_5, R_6 and R_7 are each a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy wherein at least two members of said R_3–R_7 are hydrogen and when two of said terms are ortho to one another, when taken together, represent a member selected from the group consisting of those of the formulas:



3,907,880

PROCESS FOR THE PREPARATION OF 3-ACETAMIDO--AMINOBENZOIC ACID

Christer Lennart Håkansson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Mar. 14, 1973, Ser. No. 341,224

Int. Cl.² C07C *103/30*

U.S. Cl. 260—518 R **11 Claims**

1. A process for the preparation of 3-acetamido-5-aminobenzoic acid consisting essentially of:

A. acetylating 3,5-diaminobenzoic acid with acetic anhydride in an aqueous solution in the presence of a mineral acid whereby 3-acetamido-5-aminobenzoic acid gradually precipitates in the form of its mineral acid salt; and

B. recovering the desired free acid by adding a base.

3,907,881

QUALITY OF PHTHALIC ACIDS IMPROVED BY OXIDIZABLE ORGANIC ACIDS

George E. Kuhlmann, Downers Grove, Ill., assignor to The Standard Oil Company, Chicago, Ill.

Filed Dec. 20, 1972, Ser. No. 316,862

Int. Cl.² C07C *51/33, 63/26*

U.S. Cl. 260—524 R **4 Claims**

1. A method of improving quality of phthalic acid produced by air oxidation of a xylene in the presence of a liquid phase of acetic acid solution of heavy metal oxidation catalyst and bromine which method consists essentially of conducting such oxidation in the presence of primary radical-producing, nonresidue forming co-oxidizable organic acid used in an amount in the range of 2–10 moles per gram atom of catalyst metal.

3,907,882

METHOD FOR THE OXYCARBONYLATION OF ETHYLENE AND PROPYLENE

Wolfgang Gaenzler, Darmstadt-Eberstadt; Klaus Kabs, Seeheim, and Guenter Schroeder, Ober-Ramstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Continuation-in-part of Ser. No. 372,695, June 22, 1973, abandoned. This application Mar. 29, 1974, Ser. No. 456,312

Claims priority, application Germany, June 30, 1972, 2232088

Int. Cl.² C07C *51/14, 57/04, 57/08*

U.S. Cl. 260—533 A **8 Claims**

1. In the method for preparing α,β-unsaturated carboxylic acids by the oxidative carbonylation of ethylene, propylene, or mixtures thereof with oxygen and carbon monoxide, in a substantially non-aqueous reaction medium, under pressure, at an elevated temperature, and in the presence of a catalytic amount of a catalyst soluble in said non-aqueous medium, the improvement wherein said catalyst consists essentially of a rhenium compound and, as a co-catalyst, at least one member selected from the group consisting of compounds of metals of the second and third main groups of the Periodic System, the fourth to sixth sub-groups of the Periodic System, and compounds of manganese, copper, and iron.

3,907,883

PROCESS FOR PRODUCTION OF 1,12-DODECANEDIOIC ACID

Donald E. Welton, Wilmington, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

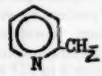
Continuation-in-part of Ser. No. 268,769, July 3, 1972, abandoned. This application Oct. 23, 1973, Ser. No. 408,279

Int. Cl.² C07C *51/00*

U.S. Cl. 260—537 P **5 Claims**

1. In a process for production of 1,12-dodecanedioic acid by reductive coupling of the adduct of cyclohexanone and hydrogen peroxide with an iron salt reducing agent and separating the desired acid from the oxidized reducing agent and by-products of the reductive coupling reaction,

the improvement which comprises effecting the reductive coupling reaction at a temperature in the range of about 20° to 100°C. without precipitation of an iron compound at any stage by using an aqueous solution containing a ferrous iron compound combined with a chelating agent, the chelating agent being of the group consisting of picolinic acid and agents of the formula $XYN(ZCO_2H)$, wherein Z is a radical of the group consisting of $—CH_2—$, $—CH_2CH_2—$ and —CHR wherein R is an alkyl or hydrocarbon aryl radical having up to 8 carbon atoms, wherein X is a radical of the group consisting of —H, $—ZCO_2H$, $—CH_2CH_2N(CH_2CO_2H)_2$ and



and Y is $—CH_2CO_2H$, the aqueous solution being maintained at a pH in the range of about 1 to about 6.

3,907,884

FORMIC ACID SYNTHESIS BY LOWER ALKYL FORMATE HYDROLYSIS

James B. Lynn, Bethlehem; Otto A. Homberg, Easton, and Alan H. Singleton, Emmaus, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 6, 1973, Ser. No. 348,834

Int. Cl.[2] C07C *51/00*

U.S. Cl. 260—542 **19 Claims**

1. A process for the manufacture of formic acid from a formate ester of an alkanol containing 1–4 carbon atoms comprising:

reacting, in a homogeneous liquid phase maintained within a temperature range of 25° C. to 150° C., an alkyl formate ester in which the alkyl constituent contains 1–4 carbon atoms, and water in a hydrolysis reaction to form formic acid and a corresponding 1–4 carbon alkanol, said liquid phase being maintained by the inclusion, in the reaction mixture, of sufficient 1–4 carbon alkanol to establish a homogeneous liquid system at the reaction temperature.

3,907,885

TETRAFLUORODITHIOSUCCINYL DIFLUORIDE AND METHOD OF PREPARING SAME

William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 4, 1974, Ser. No. 476,317

Int. Cl.[2] C07C *153/00*

U.S. Cl. 260—543 F **2 Claims**

1. Tetrafluorodithiosuccinyl difluoride.

2. The method of preparing tetrafluorodithiosuccinyl difluoride which comprises reacting trifluoroiodoethylene with sulfur vapors at a temperature from 400° to 600°C.

3,907,886

PROCESS FOR MANUFACTURE OF SUBSTITUTED CARBAMYL HALIDES

Martin L. Weakley, Pryor, Okla., assignor to Nipak, Inc., Dallas, Tex.

Continuation of Ser. No. 542,380, April 13, 1966, abandoned. This application June 10, 1970, Ser. No. 48,826

Int. Cl. C07c *51/58*

U.S. Cl. 260—544 C **8 Claims**

1. A continuous process for the manufacture of dialkyl carbamyl chlorides, comprising:

a. simultaneously passing phosgene and a dialkyl amine, selected from the group consisting of dimethyl amine and diethyl amine, at a mol ratio of phosgene to amine of at least one to one, into a body of liquified phosgene in a reaction zone maintained at a temperature of about 0° to 30° C;

b. continuously withdrawing a liquid reaction product containing said dialkyl carbamyl chloride from said reaction zone;

c. condensing phosgene, which vaporizes from said body of liquified phosgene, to separate the same from hydrogen chloride; and

d. continuously withdrawing a vaporous product comprising hydrogen chloride from said reaction zone.

3,907,887

PROCESS FOR THE PREPARATION OF 1-TERT.-BUTYL-THIOSEMICARBAZIDE COMPOUNDS

Klaus Sasse, Schildgen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

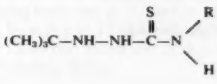
Filed May 2, 1973, Ser. No. 356,694

Claims priority, application Germany, May 4, 1972, 2221812

Int. Cl.[2] C07C *159/00*

U.S. Cl. 260—552 SC **15 Claims**

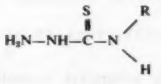
1. Process for the preparation of a 1-tert.-butyl-thiosemicarbazide compound of the formula



wherein

R is selected from the group consisting of hydrogen; alkyl, alkenyl or alkynyl of up to 16 carbon atoms; cycloalkyl of from 5 to 6 ring carbon atoms; aralkyl of up to 14 carbon atoms; aryl of up to 10 carbon atoms;

which process comprises reacting a thiosemicarbazide of the formula



wherein R is identified as above, with tertiary butanol on the presence of a concentrated mineral acid as a dehydrating agent at a temperature of from 0° to 100°C.

3,907,888

M-PHENYLUREA AND PHENYLTHIOUREA OXIME DERIVATIVES

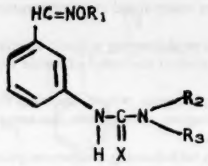
Gabriel Kornis, and Eldon G. Nidy, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 145,016, May 19, 1971, Pat. No. 3,778,473. This application May 29, 1973, Ser. No. 364,824

Int. Cl. C07c *127/00*

U.S. Cl. 260—553 A **3 Claims**

1. A compound of the formula:



wherein

R_1 = nitrophenyl selected from mononitrophenyl and dinitrophenyl.

X = a substituent selected from O and S.

R_2 = a substituent selected from H and R_3.

R_3 = alkyl of from 1 to 8 carbon atoms, inclusive, alkenyl of from 3 to 8 carbon atoms, inclusive, aralkyl hydrocarbon of from 7 to 13 carbon atoms, inclusive and aryl hydrocarbon of from 6 to 10 carbon atoms, inclusive, provided both R_1 and R_2 are not aryl hydrocarbon at the same time.

3,907,889

CHELOCARDIN DERIVATIVES

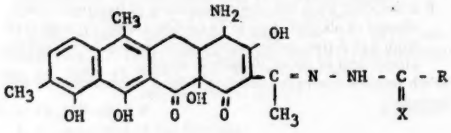
Makoto Inaba; Edith Bernstein, and David Lyon Garmaise, all of Montreal, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed June 18, 1973, Ser. No. 371,103

Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 **6 Claims**

1. A compound of the formula:



with R representing loweralkyl, cyanoloweralkyl, phenyl, benzyl, hydroxyphenyl, aminophenyl, or methoxyphenyl, and X represents =O, =S or =NH, or a pharmaceutically acceptable acid addition salt thereof.

3,907,890

PREPARATION OF ALPHA-6-DEOXY-5-HYDROXYTETRACYCLINE

Charles J. V. Scanio, Mystic, Conn., assignor to Pfizer, Inc., New York, N.Y.

Filed May 28, 1974, Ser. No. 473,791

Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 AT **6 Claims**

1. A process for the preparation of α-6-deoxy-5-hydroxytetracycline hydrochloride which comprises contacting 6-methylene-5-hydroxytetracycline or the hydrochloride salt thereof with dicobalt octacarbonyl, triphenyl phosphine and hydrochloric acid in a molar ratio of 6-methylene-5-hydroxytetracycline/dicobalt octacarbonyl/triphenyl phosphine/hydrochloric acid of 1.0/1.0/0.1–0.2/1.5–2 in a solvent for said reactants and under an inert atmosphere at a reaction temperature of 80°–115°C.

3,907,891

PURIFICATION OF METHACRYLAMIDOPROPYLTRIMETHYLAMMONIUM CHLORIDE

Lawrence James Guilbault, McMurray, and Frederick Alan Hoffstadt, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1974, Ser. No. 516,554

Int. Cl.² C07C *103/44*

U.S. Cl. 260—561 N **6 Claims**

1. The process for purifying aqueous solutions of methacrylamidopropyltrimethylammonium chloride or the free amine thereof which comprises passing an aqueous solution containing from 1 to 99 percent by weight of methacrylamidopropyltrimethylammonium chloride or the free amine thereof through an adsorption column packed with activated carbon having a mesh size between 8 to 325 mesh at a treatment level of from 1 to 3,500 pounds of methacrylamidopropyltrimethylammonium chloride or the free amine thereof per pound of activated carbon.

3,907,892

RING-SUBSTITUTED N-(2,2-DIFLUOROALKANOYL)-O-HENYLENEDIAMINE COMPOUNDS

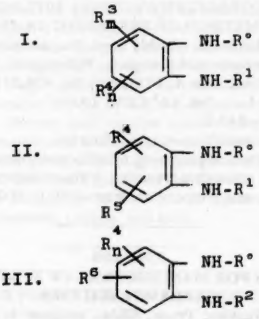
George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 277,452, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,857, June 19, 1970, abandoned, and a continuation-in-part of Ser. No. 17,865, March 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 803,998, March 3, 1969, abandoned. This application June 13, 1974, Ser. No. 479,073

Int. Cl.² C07C *103/30*

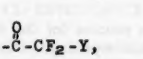
U.S. Cl. 260—562 B **11 Claims**

1. A compound selected from the group consisting of the compounds of the formulae:

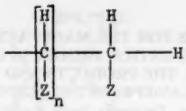


wherein

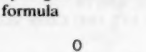
R° represents a 2,2-difluoroalkanoyl radical of the formula



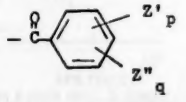
wherein Y represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1–C_6, or radical of the formula



wherein each Z independently represents hydrogen or halogen and n represents 0 or 1;
R^1 represents hydrogen
radical of the formula



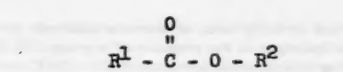
wherein Y^1 represents loweralkyl of C_1–C_4 or phenyl,
benzoyl
furoyl,
naphthoyl, or
substituted benzoyl of the formula



wherein each Z′ independently represents halo or nitro, Z″ represents loweralkyl of C_1–C_4 or loweralkoxy of C_1–C_4, p represents 0, 1, or 2, q represents 0 or 1, and the sum of p and q is 1–3;
R^2 represents
R°,
R^1,
alkanoyl of C_1–C_{18},
loweralkenoyl of C_3–C_4,
loweralkynoyl of C_3–C_4,
halogenated loweralkanoyl of C_2–C_4 bearing on any position or positions one or more halogen atoms, each independently selected, subject to the limitation that the alpha position bear at least one substituent moiety selected from the group consisting of hydrogen and halogen of atomic weight from 35 to 127, both inclusive;
each R^3 independently represents halogen;
R^4 represents nitro;
R^5 represents trifluoromethyl, difluoromethyl, or difluorochloromethyl, and in compounds of Formula II, R^4 and R^5 are meta to one another;
R^6 represents loweralkylsulfonyl of C_1–C_4 and is located at the 4 or 5 position, and any R^4 group is meta to R^6;
m represents 0–4;
n represents 0–1; and in compounds of Formula I, the sum of m and n is an integer of from 1 to 4;
subject to the further limitation that where R^1 or R^2 represents hydrogen, the ring position ortho to the —NH—R^1 or —NH—R^2 group bears one of the designated R^3, R^4, R^5, or R^6 moieties.

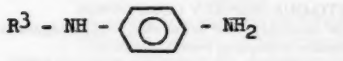
3,907,893
PREPARATION OF ANTIOXIDANT AMIDES
Dane K. Parker, Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed June 28, 1974, Ser. No. 484,050
Int. Cl.² C07C *103/44*
U.S. Cl. 260—562 R **6 Claims**

1. An improved process for the synthesis of an antioxidant amide comprising reacting a simple aliphatic or aromatic ester, either saturated or unsaturated having the general formula (A)



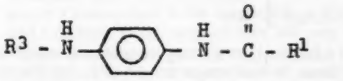
(A)

with an aromatic amine having the general formula (B)



(B)

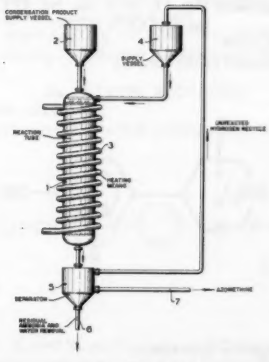
in the presence of (C), a base selected from the group consisting of alkali metal alkoxides, amides and hydrides to yield an intermediate metallic salt, the improvement comprising removing the salt, washing the salt with an organic solvent and hydrolyzing the salt with dilute acid to form an antioxidant amide of the general formula (D)



(D)

wherein R^1 is selected from the group consisting of alkyl radicals having from one to 20 carbon atoms, aryl radicals having from six to 12 carbon atoms, cycloalkyl radicals having from five to 12 carbon atoms, alkenyl radicals having from two to 10 carbon atoms, R^2 is selected from the group consisting of alkyl radicals having from one to 10 carbon atoms, and alkenyl radicals having from two to 10 carbon atoms and wherein R^3 is selected from the group consisting of alkyl radicals having from one to 20 carbon atoms, cycloalkyl radicals having from five to 12 carbon atoms, aryl radicals having from six to 12 carbon atoms and aralkyl radicals having from seven to 13 carbon atoms.

3,907,894
PROCESS FOR THE PRODUCTION OF AZOMETHINE COMPOUNDS
Hans Feichtinger, Dinslaken; Werner Kluy, Bochum-Stiepel, and Jurgen Falbe, Dinslaken, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany
Filed Nov. 24, 1972, Ser. No. 309,285
Claims priority, application Germany, Dec. 1, 1971, 2159529
Int. Cl.² C07C *119/00*
U.S. Cl. 260—566 R **13 Claims**



1. A process for the production of azomethine which comprises reacting a condensation product of a saturated ali-

phatic, saturated cycloaliphatic, or aromatic aldehyde and ammonia with hydrogen in the presence of a group VIII B metal containing catalyst at a temperature of 20°–200°C. and at atmospheric pressure.

3,907,895

KETO-QUATERNARY COMPOUNDS

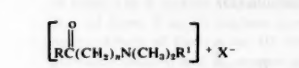
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 400,097, Sept. 24, 1973, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application Feb. 25, 1974, Ser. No. 445,542

Int. Cl. C07c *87/00*

U.S. Cl. 260—567.6 M 4 Claims

1. A chemical compound having the structural formula:



wherein R is 1-adamantyl, R^1 is a long chain alkyl group of 10 to 18 carbon atoms, *n* is an integer from 1 to 3, and X is an anion selected from the group consisting of chloride, bromide, iodide, methyl sulfate, nitrate and arylsulfonates.

3,907,896

PROCESS FOR PREPARATION OF CYCLOPENTENONES

Jean-Pierre Calame, Fallanden; Heinrich Kappeler, Wurenlos, and Peter Oberhansli, Zurich, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Apr. 5, 1973, Ser. No. 348,443

Claims priority, application Switzerland, Apr. 7, 1972, 5134/72

Int. Cl.² C07C *45/00*; C07B *5/00*

U.S. Cl. 260—586 C 4 Claims

1. A process for the manufacture of 3-methyl-2-cyclopenten-1-one, which process comprises adding acetonylacetone to a boiling aqueous alkali hydroxide solution at a rate of inflow adjusted to the rate of distillation, and azeotropically distilling off with water the 3-methyl-2-cyclopenten-1-one as it is formed.

3,907,897

CYCLOALKYLBENZALDEHYDES

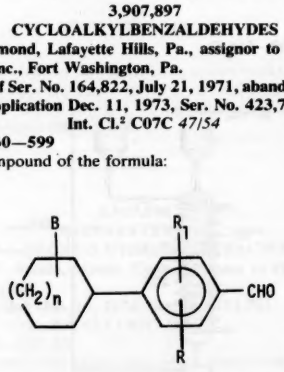
Julius Diamond, Lafayette Hills, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 164,822, July 21, 1971, abandoned. This application Dec. 11, 1973, Ser. No. 423,784

Int. Cl.² C07C *47/54*

U.S. Cl. 260—599 11 Claims

1. A compound of the formula:



where:

n is 0–2;

B is hydrogen or loweralkyl;

R is chloro or bromo in the 3 or 5 position, nitro in the 3 or 5 position, loweralkyl in the 3 or 5 position;

R′ is hydrogen, chloro in the 3 or 5 position, bromo in the 3 or 5 position, or nitro in the 3 or 5 position.

3,907,898

PROCESS FOR THE MANUFACTURE OF POLYCONDENSATION PRODUCTS CONTAINING PHOSPHORUS, THE PRODUCTS AND THEIR USE AS FLAMEPROOFING AGENTS

Hermann Nachbur, Dornach; Joerg Kern, Oberwil, and Arthur Maeder, Therwil, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 164,054, July 19, 1971, abandoned. This application Sept. 21, 1973, Ser. No. 399,576

Claims priority, application Switzerland, July 22, 1970, 11101/70; Jan. 20, 1971, 850/70

Int. Cl.² 117 *144*; C07F *9/28*

U.S. Cl. 260—606.5 P 15 Claims

1. A process for the manufacture of a reactive polymeric hydroxymethylphosphonium composition which imparts improved flame retardant properties to textiles, which comprises condensing with itself at least one anhydrous tetrakis-(hydroxymethyl)-phosphonium salt or tetrakis-(hydroxymethyl)-phosphonium hydroxide in an anhydrous medium at 100° to 150°C, until 0.5 to 1.5 mols of water have been eliminated per 1 mol of hydroxymethylphosphonium starting material, and recovering the polymeric product having 2–10 phosphonium monomer units.

3,907,899

NOVEL THIOLS AND DISULPHIDES

Adrian Charles Ward Curran, and Roger Crossley, both of Reading, England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Mar. 18, 1974, Ser. No. 452,029

Claims priority, application United Kingdom, Mar. 29, 1973, 15066/73

Int. Cl.² C07C *149/00*

U.S. Cl. 260—609 D 6 Claims

1. A process for preparing a thiol of formula

wherein R is a member of the group consisting of phenyl, lower alkoxy phenyl and dilower alkoxy phenyl and R_1 is hydrogen or lower alkyl or R and R_1 taken together represent a polymethylene chain of from 4 to 7 carbon atoms which process comprises treating an α-aminonitrile of formula

wherein R and R_1 are as defined above and R_2 is lower alkyl, with hydrogen sulphide in the presence of a pyridine solvent and a lower trialkylamine base and thereafter recovering the product.

3,907,900

STERO CONFIGURATIONS OF 3((2-MERCAPTO-1-METHYLPROPYL)THIO)-2-BUTANOL

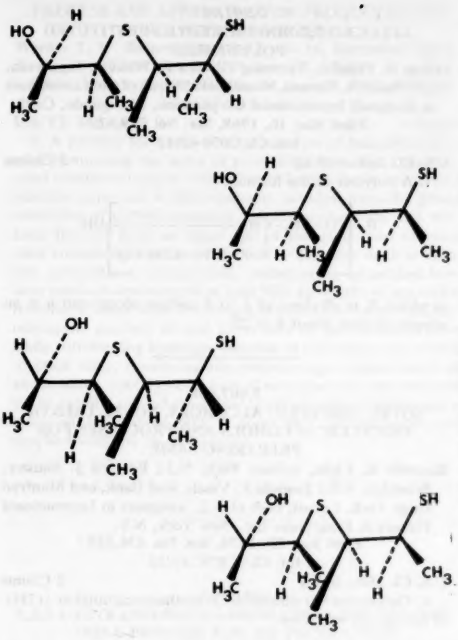
William John Evers, Atlantic Highlands; Manfred Hugo Vock, Locust, both of N.J., and Igor Alexander Pelse, Elmhurst, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 499,898

Int. Cl.² A23L *1/26*; C07C *149/18*

U.S. Cl. 260—609 R 5 Claims

1. A sulfur-containing compound having a structure selected from the group consisting of:



3,907,901

CONTINUOUS PROCESS FOR PREPARING CUMENE HYDROPEROXIDE

Raymond L. Feder, Philadelphia, Pa.; Robert Fuhrmann, Morris Plains; John Pisanchyn, Morristown, both of N.J.; Saul Elishewitz; Thomas H. Insinger, both of Philadelphia, Pa., and Chempolil Thomas Mathew, Randolph Township, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 841,585, July 14, 1969, abandoned. This application Apr. 5, 1973, Ser. No. 348,430

Int. Cl.² C07C *73/08*

U.S. Cl. 260—610 B **7 Claims**

1. In a method for the continuous preparation of cumene hydroperoxide from cumene wherein cumene is reacted with an oxygen-containing gas and the cumene hydroperoxide thus obtained is continuously recovered and unoxidized cumene is separated therefrom, purified, freed of acid, and continuously recycled to the reaction mixture as a first recycle stream, the improvement which comprises:

a. continuously adding to the reaction mixture fresh cumene having a purity of at least 99.8 percent;

b. intimately contacting said cumene with oxygen in at least one oxidation reactor by passing through the reaction mixture a continuous stream of an oxygen-containing gas containing at least 8 mol percent of oxygen at a rate wherein the ratio of mols of oxygen supplied per hour to the maximum amount of oxygen consumable per hour exceeds 0.25, and the exit gases produced contain from 3-10 percent oxygen, and continuously removing a liquid stream from said oxidation reactor and recovering the cumene hydroperoxide therefrom;

c. maintaining the reaction temperature at about 80°–120°C. and the concentration of cumene hydroperoxide in the reaction mixture at a concentration of about 8–40 percent;

d. condensing the exit gases, separating the unoxidized cumene therefrom, treating the separated cumene with an alkali metal hydroxide, followed by washing it with water and recycling it as a second recycle stream; and

e. wherein said reaction is effected without the addition of an initiator, catalyst, or an alkalizing agent.

3,907,902

METHOD FOR THE PRODUCTION OF TERTIARY-BUTYL HYDROPEROXIDE

Henry R. Grane, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 585,242, Oct. 10, 1966. This application Apr. 2, 1969, Ser. No. 812,915

Int. Cl.² C07C *179/02*

U.S. Cl. 260—610 B **5 Claims**

1. In a process for the liquid phase oxidation of isobutane wherein said isobutane is charged in the liquid phase to an oxidation reactor and contacted therein with molecular oxygen at a temperature in the range of from 200° F. to 300° F. and a pressure in the range of from 300 psig. to 700 psig. to produce a mixture of tertiary-butyl alcohol and tertiary-butyl hydroperoxide, the improvement which consists essentially of improving the selectivity of the reaction for the production of tertiary-butyl hydroperoxide for any isobutane conversion level by adding with said isobutane charged to said reactor from 0.2 weight per cent to 3.0 weight per cent based on the weight of isobutane of an alcohol selected from the group consisting of isopropyl alcohol, isobutyl alcohol and secondary butyl alcohol.

3,907,903

ORGANIC PEROXIDES

Yun Ger Chang, and Philip S. Bailey, both of Austin, Tex., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Division of Ser. No. 461,969, April 18, 1974, which is a division of Ser. No. 310,560, Nov. 29, 1972, Pat. No. 3,842,129, which is a division of Ser. No. 170,621, Aug. 10, 1971, Pat. No. 3,775,454, which is a division of Ser. No. 754,472, Aug. 21, 1968, abandoned. This application Dec. 19, 1974, Ser. No. 534,481

Int. Cl.² C07C *179/06*

U.S. Cl. 260—610 R **1 Claim**

1. An organic peroxide namely 3-cumylperoxy-3, 5, 5-trimethylcyclohexanone.

3,907,904

OPTICAL BRIGHTENERS COMPRISING ALKOXY DERIVATIVES OF DISTYRYLDIPHENYL

Christian Luethi, Muenchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

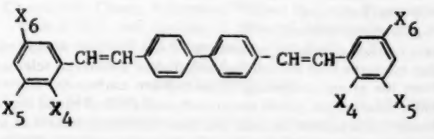
Filed Aug. 30, 1972, Ser. No. 284,800

Claims priority, application Switzerland, Sept. 1, 1971, 12827/71

Int. Cl.² C07C *43/20, 43/26*

U.S. Cl. 260—613 R **9 Claims**

1. Distyryl derivatives which correspond to the formula



wherein X_4, X_5 and X_6 are the same or different and represent hydrogen, alkyl containing from 1 to 4 carbon atoms or alkoxy containing from 1 to 4 carbon atoms, also one of the symbols X_5 or X_6 represents an allyl or crotyl group or X_4 together with X_5 represent a methylenedioxy group, in which connection,

however, at least one and up to two of the symbols X_4, X_5 and X_6 represent an alkoxy group containing from 1 to 4 carbon atoms or X_4 together with X_5 represent a methylenedioxy group.

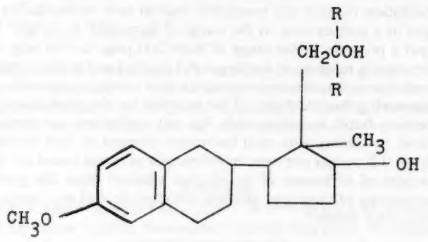
3,907,905

5-(1,2,3,4-TETRAHYDRO-6-METHOXY-2-NAPHTHYL)-2-YDROXY-1-METHYLCYCLOPENTANEETHANOLS

John H. Dygos, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 29, 1974, Ser. No. 464,826
Int. Cl.[2] C07C *43/20*
U.S. Cl. 260—613 R **5 Claims**

1. A compound having the formula



wherein R represents hydrogen or methyl.

3,907,906

PROCESS OF RECOVERING ALCOHOLS AND OIL FROM WASTE MIXTURES

David S. Cox, Hanover, Md., assignor to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 240,319, March 29, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 397,029
Int. Cl. C07c *41/12*
U.S. Cl. 260—615 R **4 Claims**

1. A method for treating waste residue mixtures produced in processes for the production of calcium and magnesium alkoxides of the monocarbonate of the monomethyl ether of diethylene glycol, said mixtures containing compounds selected from the group consisting of:

a. calcium and magnesium carbides;
b. calcium and magnesium carbide residues;
c. calcium and magnesium alcoholates wherein the alcoholic portion of said alcoholates is selected from the group consisting of alkanols containing up to about 15 carbon atoms and monomethyl ether of diethylene glycol;
d. calcium and magnesium hydroxides and oxides;
e. filter aid;
f. oil wherein said oil is inert with respect to carbonate materials; and,
g. mixtures thereof,

said method consisting essentially of reacting said waste residue mixtures with an aqueous solution of a material selected from the group consisting of ammonium carbonate, ammonium bicarbonate, alkali metal carbonates, alkali metal bicarbonates and carbon dioxide said material being present in an amount at least sufficient to effectively neutralize said carbides, carbide residues, alcoholates, hydroxides and oxides in said waste residue mixtures to produce a reaction product containing calcium and magnesium carbonates, said oil, said filter aid, said alkanols, said monomethyl ether of diethylene glycol and water and recovering said alkanols and said monomethyl ether of diethylene glycol from said reaction product.

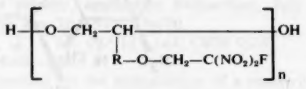
3,907,907

2-FLUORO-2,2-DINITROETHYL SUBSTITUTED POLYETHERS

Milton B. Frankel, Tarzana; Edward F. Witucki, Sepulveda, and David N. Vincent, Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1968, Ser. No. 729,822
Int. Cl. C07c *43/12*
U.S. Cl. 260—615 BF **2 Claims**

1. A polymer of the formula



in which R is alkylene of 1 to 4 carbon atoms and *n* is an integer of from about 4 to 25.

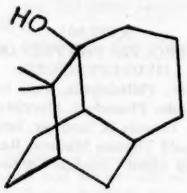
3,907,908

NOVEL TRICYCLIC ALCOHOLS, NOVEL USES OF TRICYCLIC ALCOHOLS AND PROCESSES FOR PREPARING SAME

Kenneth K. Light, Asbury Park, N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin F. Vinals, Red Bank, and Manfred Hugo Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 436,848
Int. Cl.[2] C07C *35/22*
U.S. Cl. 260—617 F **2 Claims**

1. Octahydro-9,9-dimethyl-1,6-methanonaphthalen-1(2H)-ol having the structure:



3,907,909

SYNTHESIS OF LINEAR PRIMARY ALCOHOLS FROM INTERNAL OLEFINS

Anthony Macaluso, Sr., Port Arthur, and Orville W. Rigdon, Grooves, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 8, 1973, Ser. No. 322,055
Int. Cl.[2] C07C *29/16*
U.S. Cl. 260—632 HF **7 Claims**

1. A two step process for the conversion of a feed charge consisting of predominantly internal olefins having from 4 to 17 carbon atoms per molecule to the corresponding linear alcohols having one more carbon atom to the molecule than said olefins which comprises heating said charge with a cobalt salt of an organic acid and a ligand consisting of a tertiary organophosphine at a reaction temperature of from about 300°F to about 500°F in the absence of carbon monoxide and hydrogen or in the presence of carbon monoxide but without hydrogen thereby isomerizing said olefins to their alpha structure; maintaining the reaction mixture at said temperature for about 15 minutes; then hydroformylating said alpha olefins by contacting said reaction mixture containing said alpha olefins with synthesis gas under a pressure of from about 1000 to 3500 psig for a reaction time of from about 1 to 20 hours and recovering predominantly linear primary alcohols.

3,907,910

PROCESS AND APPARATUS FOR PRODUCTION OF HEXACHLOROBENZENE

Werner T. W. Barkow, pase de Gracia 56, Barcelona, Spain

Filed June 3, 1970, Ser. No. 43,009
Claims priority, application Spain, June 3, 1969, 368.356
Int. Cl.[2] C07C *25/12*
U.S. Cl. 260—650 R 3 Claims

1. A process for continuous production of hexachlorobenzene comprising the steps of providing a reaction zone supplied counter currently with chlorine from a lower end of said reaction zone and a chlorobenzene selected from the group consisting of trichlorobenzene, tetrachlorobenzene, and mixtures thereof, from an upper end of said zone, said reaction zone containing a catalyst effective to promote nuclear chlorine substitution; continuously withdrawing hexachlorobenzene product consisting of at least 90% by weight of hexachlorobenzene based upon the weight of said withdrawn hexachlorobenzene product at said lower end of said reaction zone while withdrawing hydrogen chloride at said upper end of said reaction zone; simultaneously maintaining a temperature of above about 200°C over a part of said reaction zone situated in the vicinity of said lower end supplied with chlorine and a temperature of about 60°C ± about 40°C at said upper end supplied with the chlorobenzene.

3,907,911

1,2,3,4-TETRABROMO-1,4-DICHLORO-1,3-BUTADIENE AND A PROCESS FOR ITS PRODUCTION

Norman L. Ruland, Conroe, and David G. Walker, Baytown, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jan. 22, 1973, Ser. No. 325,824
Int. Cl.[2] C07C *21/20*
U.S. Cl. 260—655 7 Claims

1. 1,2,3,4-Tetrabromo-1,4-dichloro-1,3-butadiene.

3,907,912

FLUID BED OXYCHLORINATION OF ETHYLENE

Albert Antonini; Philippe Joffre, both of Paris, and Francois Laine, Martiques, all of France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 730,604, May 20, 1968, abandoned. This application May 27, 1971, Ser. No. 147,611
Int. Cl. C07c *17/02*
U.S. Cl. 260—659 A 11 Claims

1. A process for the oxychlorination of ethylene to produce a product in which at least 9 mole percent of the ethylene is converted to 1,1,2-trichloroethane and 1,1,2,2-tetrachloroethane with not more than 5 mole percent of the ethylene converted to combustion products and not more than 3 mole percent of the ethylene converted to chloroethylenes comprising the steps of passing a gaseous mixture of ethylene, HCl and an oxygen-containing gas through a reaction zone maintained at a temperature within the range of 280° to 370°C. in the presence of an oxychlorination catalyst deposited on a carrier consisting essentially of silica and magnesia having a surface area within the range of 10–200 m^2/g. in a fluidized state, in which the materials are advanced into the reaction zone in a molar ratio of $O_2C_2H_4$ within the range of 0.63 to 0.9, HCl/O_2 within the range of 2.6 to 4.30 and HCl/C_2H_4 within the range of 2.10 and 3.05.

3,907,913

ISOMERIZATION PROCESS

Jacob D. Kemp, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 422,621, Dec. 7, 1973, which is a continuation-in-part of Ser. No. 268,296, July 3, 1972, abandoned. This application June 11, 1974, Ser. No. 478,406
Claims priority, application Germany, June 19, 1973, 2231043; Canada, June 5, 1973, 173287
Int. Cl.[2] C07C *5/28*
U.S. Cl. 260—666 P 9 Claims

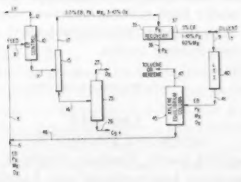
1. In a process for isomerizing a feed comprising methylcyclopentane, cyclohexane, or mixtures thereof, by contacting the feed with a $HF{\cdot}SbF_5$ catalyst on a porous solid inert support at a temperature between −10° and 400°F, the improvement which comprises reducing the deactivation rate of the catalyst by including sufficient isobutane in the feed so that the feed isobutane content is 30 to 60 weight percent and the naphthenes content in the feed is 70 to 40 weight percent.

3,907,914

ISOMERIZATION OF AROMATIC HYDROCARBONS

James L. Willis, Jr., and Philip Grandio, Jr., both of Beaumont, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 133,571, April 13, 1971, abandoned. This application July 17, 1973, Ser. No. 380,057
Int. Cl. C07c *5/24*
U.S. Cl. 260—668 A 3 Claims



1. A process for effecting catalytic isomerization of a xylene mixture which comprises contacting said mixture in the liquid phase in the absence of added hydrogen at a temperature within the range of 350°F. to 650°F. at a pressure of up to about 2000 psig. at a liquid hourly space velocity within the range of 0.05 to 40 in the presence of 5 to 30 weight percent, based on the xylene feed mixture, of ethylbenzene and a crystalline zeolite composition having a composition, in terms of mole ratios of oxides, as follows:

$0.9{\pm}0.2\ M_2O/n{:}\ W_2O_3 : 3\text{–}20\ YO_2 : z\ H_2O$ wherein M is a cation, n is the valence of said cation, W is aluminum and Y is silicon; and z is between 0 and 20.

3,907,915

CONVERSION OF CARBONYL COMPOUNDS TO AROMATICS

Clarence D. Chang, Princeton; William H. Lang, Pennington, both of N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,224
Int. Cl.[2] C07C *1/20*
U.S. Cl. 260—668 R 12 Claims

1. In the process for converting a carbonyl containing aliphatic organic compound reactant which comprises catalyzing said conversion with a crystalline aluminosilicate zeolite having a high silica to alumina ratio; the improvement which comprises catalyzing said conversion with a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12; carrying out

said conversion at about 1 to 200 atmospheres, 0.5 to 50 LHSV and 400° to 1,000°F; and converting said carbonyl compounds to a product comprising water and a conjunct mixture of hydrocarbons having a C_5^+ non-aromatic hydrocarbon fraction, a C_4^- normally gaseous hydrocarbon fraction and an aromatic hydrocarbon fraction boiling in the gasoline boiling range.

3,907,916
DEHYDROGENATION OF ALKYL AROMATIC HYDROCARBONS

Frederick John Soderquist, Essexville; Theodore Thaddeus Wazbinski, Bay City, and Nathan Waldman, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 14, 1974, Ser. No. 433,033
Int. Cl.² C07C *5/18, 15/10;* **B01D** *15/06*
U.S. Cl. 260—669 R **20 Claims**

1. In a method of activating self-regenerative dehydrogenation catalysts useful for dehydrogenating alkyl aromatic hydrocarbons having from 1 to 2 six membered rings and from 1 to 2 alkyl groups of 2–3 C atoms to the corresponding alkenyl aromatic hydrocarbon, by passing a mixture of steam and said alkyl aromatic hydrocarbon over said catalyst at a temperature of from about 600° to about 700°C., the improvement comprising interrupting the feed of the said alkyl aromatic hydrocarbon and continuing the feed of steam at the said temperature for a period of 7–30 minutes each 24–48 hours with little or no carbon oxide effluence during the activation cycle to provide a catalyst activation cycle, resuming the feed of said alkyl aromatic hydrocarbon for dehydrogenation thereof under high severity reaction conditions, and repeating said activation cycles and said alkyl aromatic hydrocarbon dehydrogenation cycles.

3,907,917
ISOPRENE PRODUCTION

Timothy Frederick Forth, Fetcham, England, assignor to The British Petroleum International Ltd., London, England

Filed Dec. 4, 1974, Ser. No. 529,559
Int. Cl.² C07C *1/30*
U.S. Cl. 260—680 R **10 Claims**

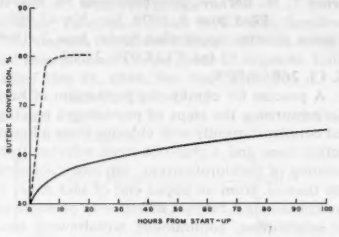
1. A process for the production of isoprene from 2-methylbutene-2 which process comprises reacting in the gas phase 2-methylbutene-2 with gaseous chlorine in a chlorine to 2-methylbutene-2 molar ratio of between 0.8:1 and 3:1 at a temperature below 400°C and a pressure below 2000 psig to form a product containing chlorinated 2-methylbutene-2 and subsequently dehydrochlorinating said product in the presence of an inert diluent selected from n-butane and isobutane and in the absence of a catalyst at a temperature between 300° and 800°C. and at a pressure below 2,000 psig.

3,907,918
PROCESS FOR REDUCING THE INDUCTION PERIOD OF OXYDEHYDROGENATION CATALYSTS

Tom Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 126,714, March 22, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,245
Int. Cl.² C07C *5/18*
U.S. Cl. 260—680 E **7 Claims**

1. A process for oxidatively dehydrogenating olefins containing at least four carbon atoms which comprises contacting a catalyst with steam, an olefin and oxygen under steady-state dehydrogenating conditions to produce conjugated diolefins, said catalyst having been brought to a steady-state rate of conversion by contacting said catalyst with steam and olefins at an induction steam to olefin molar ratio greater than 45 to 1 and said dehydrogenating being conducted at steady-state conditions at a steam to olefin molar ratio less than said induction steam to olefin ratio within the range of from about 25 to 1 to about 45 to 1.



3,907,919
DEHYDROGENATION OF HYDROCARBONS

Ching-tsan Lo; Joe Jed Miller, and Norbert Francis Cywinski, all of Odessa, Tex., assignors to El Paso Products Company, Odessa, Tex.

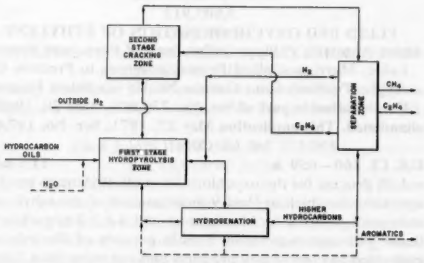
Filed Apr. 9, 1973, Ser. No. 349,328The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.
Int. Cl.² C07C *5/38*
U.S. Cl. 260—680 R **9 Claims**

1. A method for the dehydrogenation of hydrocarbons to form diolefins without the addition of oxygen by the steps comprising contacting said hydrocarbons with a dehydrogenation catalyst in aa first zone and then in a second zone with a reducible oxidation catalyst selected from the group consisting of bismuth vanadate and bismuth molybdate promoted by palladium, platinum and/or chromium as elements or compounds.

3,907,920
TWO-STAGE HYDROPYROLYSIS-CRACKING PROCESS FOR PRODUCING ETHYLENE

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 25, 1974, Ser. No. 454,482
Int. Cl.² C07C *3/40;* **C10G** *13/28*
U.S. Cl. 260—683 R **9 Claims**



1. A process for producing ethylene from higher hydrocarbons comprising

a. introducing a hydrocarbon oil and hydrogen to a first-stage hydropyrolysis zone, the mol ratio of hydrogen to hydrocarbon oil being at least 1/1;

b. hydropyrolyzing the hydrocarbon oil in the presence of the hydrogen in said zone under conditions of temperatures in the range of about 600°C to 900°C, pressures of at least about 5 atmospheres gauge and residence times in the range of about 0.1 to 60 seconds, to produce a hydropyrolysis effluent;

c. introducing substantially all of the hydropyrolysis effluent to a second-stage cracking zone and subjecting said effluent to cracking conditions of temperatures in the range of about 750°C to 900°C, pressures not in excess of about 2 atmospheres gauge and residence times in the range of about 0.01 to 10 seconds, to produce a cracking zone effluent;

d. separating said cracking zone effluent into a hydrogen stream, a methane stream, an ethylene stream, an ethane stream, and a higher hydrocarbon stream;

e. recycling the hydrogen stream to the first stage hydropyrolysis zone and recycling the ethane stream to the second-stage cracking zone;

f. and recovering the methane stream and ethylene stream.

3,907,921
WATER INJECTION IN A DEHYDROGENATION PROCESS

George R. Winter, III, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 25, 1974, Ser. No. 463,954
Int. Cl.² C07C *5/18*
U.S. Cl. 260—683.3 **12 Claims**

1. A process for the dehydrogenation of normal paraffins which comprises the steps of:

a. injecting 5 to 25 wt. ppm. of water, based on the fresh hydrocarbon feed rate, into a hydrocarbon feed stream comprising normal paraffins having 5 to 18 carbon atoms per molecule;

b. passing the hydrocarbon feed stream in admixture with a gaseous recycle stream through a reaction zone maintained at dehydrogenation conditions and containing a dehydrogenation catalyst comprising a platinum component and an alkali or alkaline earth component supported on a porous alumina carrier materail; and,

c. increasing the rate of water injection into the fresh hydrocarbon feed stream to a value of 25 to 125 wt. ppm. after at least 40% of the normal paraffins which may be processed before the catalyst requires replacement have passed through the reaction zone.

3,907,922
PROCESS FOR DIMERIZING VINYLIDENE COMPOUNDS

William J. Heilman, Allison Park, and Thomas J. Lynch, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 274,319, July 24, 1972. This application Nov. 21, 1974, Ser. No. 525,720
Int. Cl.² C07C *3/18*
U.S. Cl. 260—683.15 B **7 Claims**

1. The process for preparing a substantially pure dimer of a vinylidene compound which comprises reacting a composition having the formula

$$R—(CH_2)_2—C(R)=CH_2$$

wherein each R group is a saturated alkyl group independently having from about four to about 12 carbon atoms in the presence of a catalytic amount of a 1:1 molar complex of boron trifluoride with a lower alkyl alcohol having from one to six carbon atoms or mixtures thereof at a temperature between about −10° and about 200° C. and recovering a composition having the formula

$$R—(CH_2)_2—C(R)=CH—C(CH_3)(R)—(CH_2)_2—R$$

in which each R group is independently selected from alkyl groups having from four to 12 carbon atoms.

3,907,923
OLIGOMERIZATION PROCESS

Jin Sun Yoo, South Holland, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 49,968, June 25, 1970, Pat. No. 3,725,306. This application Dec. 11, 1972, Ser. No. 314,147
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D **9 Claims**

1. In a process for the oligomerization of one or more alpha-mono olefins selected from the group consisting of ethylene and propylene to form a major portion of a dimer product, the improvement which comprises conducting said oligomerization in contact with a heterogeneous catalyst comprising:

a. a minor, catalytically effective amount of a nickel complex of the formula

$$(L)_mNi(CO)_n$$

wherein L is a tertiary, hydrocarbyl-substituted monodentate ligand of a Group VA element, *m* is an integer value from 1 to 3 and *n* is an integer value of 1 to 3 the sum of *m* and *n* being 4; and

b. a major amount of an acidic, solid, silica-based support material as an essential catalyst component.

3,907,924
METHOD OF PRODUCING SYNTHETIC LUBRICATING OIL

Hiroshi Isa, Funabashi; Hajime Tomooka, Ichikawa; Yoshihiko Murakami, Yachiyo; Kenji Karube, Tokyo; Takeshi Inomiya, Tokyo, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1974, Ser. No. 446,018
Claims priority, application Japan, Mar. 5, 1973, 48-026351
Int. Cl.² C07C *3/10*
U.S. Cl. 260—683.15 D **6 Claims**

1. In a method of producing a synthetic lubricating oil which comprises polymerizing a feed olefin by contacting said feed olefin with a catalyst system selected from the group consisting of (1) a catalyst complex prepared from a titanium halide and at least one kind of alkyl aluminum compound selected from the group consisting of AlR_3, AlR_2, $AlR_{1.5}Cl_{1.5}$ and $AlRCl_2$, wherein R is alkyl, and (2) a ternary catalyst consisting essentially of an alkali metal hydride compound, an aluminum halide and a titanium halide, the improvement which comprises:

said feed olefin contains from about 90 to 100 mole percent of a mixture of α-olefins selected from the group consisting of octene-1, nonene-1 and decene-1, said mixture containing less than 30 mole percent of nonene-1 and having an average carbon atom number in the range of 8.7 to 9.7, and the balance of the feed olefin is α-olefins of lower carbon atom number, and recovering from the polymerization reaction mixture a synthetic lubricating oil having a viscosity at 210°F of above 3.5 centistokes, a viscosity at 100°F of above 16.5 centistokes, a viscosity at −40°F of below 2,600 centistokes, a flash point above 400°F, a fire point above 475°F, a pour point of below −65°F and a viscosity index above 120.

3,907,925
METAL DEACTIVATORS AS ADHESION PROMOTORS FOR VULCANIZABLE ELASTOMERS TO METALS

George K. Cowell, Brunswick, Ohio, and David J. Cherry, Somers, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 10, 1973, Ser. No. 404,972
Int. Cl.² B29H *5/02*
U.S. Cl. 260—791 **7 Claims**

1. A method of improving adhesion between a vulcanizable elastomeric composition and a metal surface to provide a strong and durable bond, which method comprises

a. adding to a vulcanizable elastomeric composition from 0.05 phr to 10 phr by weight based on the weight of the

elastomer of an organic hydrazine derivative with metal deactivating efficiency, and

b. vulcanizing the composition while it is in contact with the metal surface.

3,907,926

BLENDS OF THERMOPLASTIC COPOLYETHERESTER WITH POLY-BUTYLENE TEREPHTHALATE

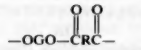
Morton Brown, and Robert M. Prosser, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1973, Ser. No. 425,969

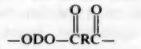
Int. Cl. C08g *39/10*

U.S. Cl. 260—860 **9 Claims**

1. A substantially uniform blend of (a) about 5–200 parts by weight of poly(butylene terephthalate) having a melt index not greater than 50 at 250°C with a 2160-g. load and (b) 100 parts by weight of a copolyetherester composition consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula

I 

and said short chain units being represented by the formula

II 

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a molecular weight of about 400–6000 and a carbon to oxygen ratio of about 2.0–4.3; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300 and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; provided said short chain ester units amount to about 15–95 percent by weight of said copolyester.

3,907,927

WATER-SOLUBLE, VINYL-PYRROLIDONE-ACRYLAMIDE BLOCK COPOLYMERS

Lawrence James Guilbault, McMurray, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1974, Ser. No. 465,660

Int. Cl. C08f *15/00, 45/24*

U.S. Cl. 260—875 **1 Claim**

1. A block polymer of the formula A-B-A wherein the A block represents from 10 to 100,000 mer units of acrylamide monomer and the B block represents from 10 to 5,000 ner units of N-vinylpyrrolidone.

3,907,928

POLYVINYL CHLORIDE RESIN COMPOSITION

Hirohide Kumabe, Musashino; Akio Morimoto; Yozo Kitagawa, both of Yokkaichi, and Nobuhide Shiraishi, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Japan

Continuation of Ser. No. 177,159, Sept. 1, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,330

Int. Cl.[2] C08L *55/02, 57/08*

U.S. Cl. 260—876 R **3 Claims**

1. Polyvinyl chloride resin composition prepared by mixing 95 to 70 parts by weight of polyvinyl chloride resin with 5 to 30 parts of the graft polymer which is produced from 30 to 60 parts by weight of solid rubber material based on 100 parts of the graft polymer of styrene-butadiene copolymer latex, in which the combined styrene amounts to less than 50% by weight, more than 80% by weight of the copolymer latex particles are of a particle diameter smaller than 0.15μ, and 70 to 40 parts by weight of monomers consisting of 30 to 70% by weight of methyl methacrylate, 70 to 30% by weight of styrene and 0 to 20% by weight of acrylonitrile, by graft polymerization comprising first mixing in the absence of an added polymerization initiator 85 to 15% by weight of methyl methacrylate used for the graft polymerization with the copolymer latex and agitating them for 0.5 to 7 hours at a temperature of 60° to 95°C and then adding the remainder of methyl methacrylate, styrene and acrylonitrile over more than a 2 hour period in the presence of a polymerization initiator until the polymerization is completed.

3,907,929

COMPATIBLE THREE-COMPONENT POLYMER ALLOYS

Richard R. Durst, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 215,682, Jan. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 101,176, Dec. 23, 1970, abandoned. This application Apr. 29, 1974, Ser. No. 464,901

Int. Cl.[2] C08L *53/02, 25/06, 25/10*

U.S. Cl. 260—876 B **16 Claims**

1. A blend characterized by exhibiting excellent properties such as impact strength at low temperatures as well as room temperatures, said blend consisting essentially of

A. a matrix of polymers prepared from at least 90 weight percent monovinyl aryl monomers including at least 35 weight percent styrene, any other monomers being other ethylenically unsaturated monomers, said polymers having a number average molecular weight of from about 50,000 to 500,000;

B. non-crosslinked polymers prepared from at least 60 weight percent 1,3-butadiene, 0 to 40 weight percent styrene or alpha-methylstyrene and 0 to 10 weight percent of other ethylenically unsaturated monomers, the number average molecular weight of said polymers being at least 100,000; and

C. graded block copolymers of the type AB in which A represents essentially polymerized styrene, the balance of said segment being polymerized butadiene, and B represents essentially polymerized butadiene, the balance of said segment being polymerized styrene, the weight ratio of total styrene to total butadiene in A and B ranging from 35:65 to 60:40, the number average molecular weight of said block copolymers being from 150,000 to 500,000, said graded block copolymers having a principal glass transition temperature of about −90°C. ± 5°C.;

components (B) and (C) being in said component (A) as a discontinuous phase of particles of which at least 70 weight percent have diameters in the range of 0.2 to 5 microns, components (A) and (B) being present in a weight ratio of at least about 4:1 and being sufficiently incompatible that the ultimate blend without (C) distinctly shows the glass transition temperature of (B), component (B) being present in the blend in an amount of at least about 3 weight percent, component (C) being present in the blend in an amount of from about 6 to 50 weight percent of the total blend, the weight ratio of component (C) to component (B) being at least 0.5 and the total monovinyl monocyclic aryl units in components (A), (B) and (C) being from 75 to 90 weight percent of the total units in said components.

3,907,930

TOUGHENED POLYMERIC POLYBLEND HAVING HIGH FLOW AND DUCTILITY

Vincent J. O'Grady, North Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 9, 1973, Ser. No. 414,468
Int. Cl. C08g 15/00, 19/00
U.S. Cl. 260—876 B 19 Claims

1. A polymeric polyblend having high melt flow and ductility comprising, based on the total weight of the polymeric components, of:

A. about 55 to 98 weight percent of a monoalkenyl aromatic polymer, comprising at least one monoalkenyl aromatic monomer of the formula:

where Ar is selected from the group consisting of phenyl, halophenyl alkylphenyl, alkylhalophenyl and mixtures thereof and X is selected from the group consisting of hydrogen, halogen and an alkyl radical of less than three carbon atoms and mixtures thereof,

B. about 1 to 15 percent by weight of a diene rubber moiety dispersed as grafted diene rubber particles, said rubber particles being grafted with and having occluded said monovinylidene aromatic polymer, wherein said grafted diene rubber particles has said grafted and said occluded polymer present in an amount of 0.5 to 4 parts to 1 part of rubber, are crosslinked having a swelling index of 5–25 and a weight average particle size diameter of 0.1 to 20.0 microns,

C. about 1 to 30 percent by weight of a block copolymer comprising a first block of from about 55–90 weight percent of said monoalkenyl aromatic monomer and a second block of from about 10 to 45 weight percent of a diene monomer.

3,907,931

HIGH IMPACT TWO-COMPONENT POLYSTYRENE BLENDS

Richard R. Durst, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 215,681, Jan. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 99,241, Dec. 17, 1970, abandoned. This application Apr. 29, 1974, Ser. No. 464,900
Int. Cl.[2] C08L 53/02, 25/06
U.S. Cl. 260—876 B 12 Claims

1. A composition characterized by exhibiting excellent properties such as impact strength at low temperatures as well as room temperatures, said composition consisting essentially of a blend of

A. a matrix of polymers prepared from at least 90 weight percent styrene monomer, any other monomers being other ethylenically unsaturated monomers, said polymers having a number average molecular weight of from about 50,000 to 500,000; and

B. graded block copolymers of the type AB in which A represents essentially polymerized styrene, the balance of said segment being polymerized butadiene, and B represents essentially polymerized butadiene, the balance of said segment being polymerized styrene, the weight ratio of total styrene to total butadiene in A and B being in the range of 15:85 to 45:55, the number average molecular weight of said block copolymers being from 100,000 to 500,000, said graded block copolymers having a principal glass transition temperature of about −94°C. ±6°C.;

component (B) being dispersed in component (A) as a discontinuous phase of particles of which at least 70 weight percent have diameters in the range of 0.2 to 5 microns and the total styrene units in components (A) and (B) being from 75 to 90 weight percent of the total units in said components.

3,907,932

COLOR STABILIZATION OF NITRILE-CONTAINING POLYMERS WITH ORGANOTIN COMPOUNDS

Alice W. Kennedy, Northfield; Raymond S. Shank, Brecksville, and Eddie Wardlow, Jr., Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed July 11, 1974, Ser. No. 487,466
Int. Cl.[2] C08F 45/62
U.S. Cl. 260—881 14 Claims

1. A polymer composition stable toward thermal discoloration containing from about 0.05 to 2.0 parts by weight of an organotin maleate compound per hundred parts of resin, wherein said organotin maleate is selected from the group consisting of the dialkyltin maleates having the formula:

$$(R_2SnC_4H_2O_4)_x$$

where x is an integer of from 1 to 4, and R is an alkyl group containing from 2 to 12 carbon atoms, and

the dialkyltin-bis-maleate half esters having the formula:

$$R_2Sn(C_4H_2O_4R')_2$$

where R is defined as above and R′ is an alkyl group containing from 4 to 14 carbon atoms,

and wherein said polymer is a copolymer composed of 100 parts by weight of:

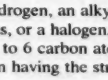
A. at least 50% by weight of at least one nitrile having the structure

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

B. up to 50% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of:

1. styrene,

2. an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

3. an alpha-olefin having the structure

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

4. a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers, and

5. vinyl acetate, and

wherein said monomers are copolymerized in the presence of from 0 to 40 parts by weight of:

C. a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene and a nitrile monomer having the structure

wherein R has the above designation, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

3,907,933

COPOLYMERS OF PIVALOLACTONE AND ISOPRENE OR BUTADIENE

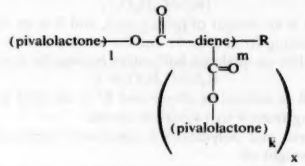
Robert Paul Foss, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 324,502, Jan. 17, 1973, Pat. No. 3,821,331, which is a continuation-in-part of Ser. No. 227,258, Feb. 17, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 413,367

Int. Cl.[2] C08L 9/00, 13/00

U.S. Cl. 260—887 **10 Claims**

1. A copolymer derived from pivalolactone and a diene selected from isoprene and butadiene,



wherein

l and *k* are between about 5 to 4,000,

m is between about 25 to 25,000

x is from about 1 to 350, and

R is alkyl of 1 to 12 carbons;

and wherein the molecular weights of the polypivalolactone segments vary between about 500 to 400,000 and the molecular weights of the polydiene segments vary between about 1300 to 1,700,000, said copolymer being further characterized by having a melt index of zero at 180°C. and at least 2.0 at 250°C.

3,907,934

HIGH IMPACT COMPOSITIONS OF PVC AND CHLORINATED POLYALKENAMERS

Gino Dall'Asta, and Pietro Meneghini, both of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 218,556, Jan. 17, 1972, Pat. No. 3,798,291, which is a continuation of Ser. No. 870,424, Oct. 21, 1969, abandoned. This application Jan. 4, 1974, Ser. No. 430,890

Claims priority, application Italy, Oct. 21, 1968, 22766/68

Int. Cl.[2] C08F 29/24

U.S. Cl. 260—899 **4 Claims**

1. Compositions of PVC comprising

a. a vinyl chloride polymer selected from the group consisting of vinyl chloride homopolymer having a Fikentscher *K* value from 45 to 90 and copolymers of vinyl chloride with up to 30% by weight of vinylacetate, vinyl maleate, vinyl pivalate or propylene having a Fikentscher K value from 45 to 90, and

b. from 5 to 30% by weight, on the composition weight of a chlorinated polyalkenamer having a chlorine content of 20 to 51% by weight and in which the chlorine atoms are linked to two adjacent carbon atoms belonging to units having the structure —CHCl — CHCl — $(CH_2)_n$— *wherein* *n* is a whole number from 3 to 10, containing a double bond content of 0 to 5 double bonds per 100 carbon-to-carbon bonds.

3,907,935

OLEFINIC POLYMERS HAVING A HIGH DYE RECEPTIVITY AND METHOD FOR PREPARATION THEREOF

Alberto Bonvicini, Terni; Giuseppe Cantatore, Collescipoli (Terni), and Fabrizio Balata, Rome, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 359,268, May 11, 1973, abandoned, which is a continuation of Ser. No. 150,861, June 1, 1971, abandoned. This application Aug. 23, 1974, Ser. No. 500,102

Claims priority, application Italy, June 3, 1970, 25448/70

Int. Cl.[2] C08F 29/12, 33/08

U.S. Cl. 260—895 **8 Claims**

1. A dyeable polyolefin composition comprising about 99 to 75 percent by weight of crystalline polyolefine and about 1 to 25 percent by weight of a basic nitrogen-containing polyamide obtained by the reaction of a tertiary polyamine selected from the group consisting of N-(2-aminoethyl)-piperazine, N,N-dimethlethylenediamine, N,N-diethylethylenediamine, N-(3-aminopropyl)-morpholine, N-(3-aminopropyl)-piperidrine, N-(2-aminoethyl)-pyrrolidine, N,N-dimethyltrimethylenediamine and N,N-diethyltrimethylenediamine, with a polymer selected from the group consisting of (1) homopolymers of an alkyl ester monomer selected from the group consisting of alkyl esters of acrylic acid, methacrylic acid, crotonic acid, citraconic acid, fumaric acid, maleic acid, mesaconic acid and itaconic acid, (2) copolymers consisting of said alkyl ester monomers, and (3) copolymers of said alkyl ester monomers with an unsaturated monomer copolymerizable therewith and selected from the group consisting of styrene, alpha-methylstyrene, vinyl-toluene, indene, acenaphthylene, N-vinylcarbazole, 2-vinylpyridine, and 2-methyl-5-vinylpyridine.

3,907,936

0,0,0′,0′-TETRAALKYL, 0,0′-VINYLENEDI-P-PHENYLENE PHOSPHOROTHIOATES

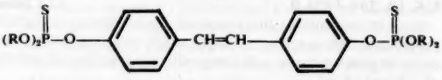
Stephen David Levy, Trenton; Gordon Paul Poeschel, Pennington, and Michael Stanley Scrider, South Bound Brook, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 11, 1974, Ser. No. 460,257

Int. Cl.[2] C07F 9/165; A01N 9/36

U.S. Cl. 260—930 **6 Claims**

1. A compound selected from those of the formula:



wherein R is alkyl C_1–C_4 and trans and cis isomer thereof.

3,907,937

ALPHA-CYANO-ALPHA-DIALKYLPHOSPHONATO ACETANILIDES

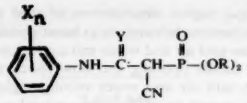
William D. Dixon, Kirkwood, Mo., and Maureen E. Becker, Glen Ellyn, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 9, 1974, Ser. No. 495,958

Int. Cl.[2] C07F 9/40

U.S. Cl. 260—940 **7 Claims**

1. Compounds of the formula



wherein:
X is halogen, CN or a C_{1-10} alkyl or alkoxy group;
n is an integer from 0–5;
Y is oxygen or sulfur and the
R's are alkyl groups having from 1–10 carbon atoms.

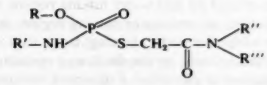
3,907,938

S-(AMIDOCARBONYL)-METHYL-O-ALKYL-MONOTHIOPHOSPHORIC ACID ESTER AMIDES

Claus Stölzer, Wuppertal, Vohwinkel; Ingeborg Hammann, Cologne, and Günter Unterstenhöfer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 2, 1973, Ser. No. 385,001
Claims priority, application Germany, Aug. 16, 1972, 2240032
Int. Cl.² C07F 9/24; A01N 9/36
U.S. Cl. 260—943 **5 Claims**

1. An S-(amidocarbonyl)-methyl-monothiophosphoric acid ester amide of the formula



(I)

in which
R and R′ each independently is alkyl of 1 to 6 carbon atoms,
R″ is alkyl or alkenyl of 1 to 6 carbon atoms optionally carrying at least one chlorine, C_1–C_6 alkoxy or C_1–C_6 alkylmercapto radical,
R‴ is hydrogen or acyl with the proviso that R‴ is not hydrogen is R″ is unsubstituted alkyl.

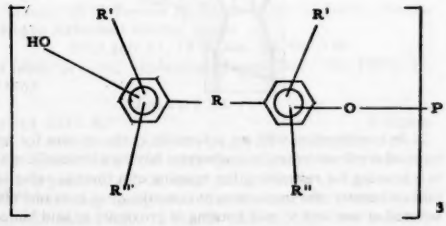
3,907,939

PHOSPHITE ESTERS OF HINDERED PHENOLS

Michael Robin, Colonia, and Sheldon R. Schulte, Highland Park, both of N.J., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed June 16, 1969, Ser. No. 833,806
Int. Cl.² C07F 9/145; C08K 5/53
U.S. Cl. 260—953 **8 Claims**

1. A phosphite ester of the formula:



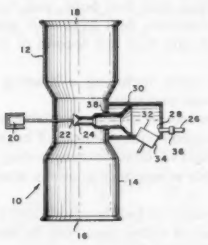
wherein R is a saturated aliphatic hydrocarbon linkage (alkylidenes and alkylenes) having 1–8 carbon atoms, the OH group on each ring is either ortho or para to R, each R′ represents the same or different alkyl, cycloalkyl or aryl groups of 1–22 carbon atoms ortho to the OH group on each ring, each R″ represents the same or different alkyl, cycloalkyl or aryl groups of 1–22 carbon atoms para to the OH group on each ring if R does not occupy such position and is ortho to the OH group on each ring if R is in the para position to the OH group.

3,907,940

SONIC CARBURETOR SYSTEM

Arthur K. Thatcher, P.O. Box 352, Merritt Island, Fla.

Filed Sept. 25, 1970, Ser. No. 75,641
Int. Cl.² F02M 27/08
U.S. Cl. 261—1 **10 Claims**

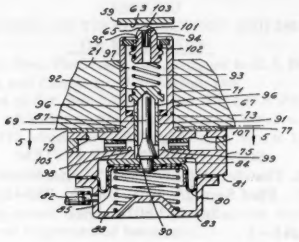


1. A carburetor system for connection between a fuel source and the intake manifold of an internal combustion engine comprising a carburetor housing defining an internal carburetor chamber, said housing including an air intake opening and an opening to said intake manifold, fuel input means for receiving fuel from said fuel source and providing a fuel dispersion to an airstream flowing within said carburetor chamber between said intake opening and said opening to the intake manifold, said fuel input means including an enclosed mixing chamber mounted externally of said carburetor housing and including outlet means connecting said mixing chamber to said internal carburetor chamber, a fuel inlet connected to provide fuel from said fuel source, and a sound wave producing means having an active vibrating surface to receive fuel from said fuel inlet and to impart sonic energy thereto, said active surface being formed by a fuel conduit section connected between said fuel inlet and said mixing chamber and having a first outer extremity positioned to receive fuel from said fuel inlet and a second outer extremity, said second outer extremity being positioned so that fuel passing to said mixing chamber is caused to move across the extent of the active surface between said first and second outer extremities, vibrator means connected to induce sonic vibrations in said fuel conduit section, and a fuel diverter means mounted within said fuel conduit section, said fuel diverter means operating to divert fuel from said fuel inlet outwardly against the inner surfaces of said fuel conduit section.

3,907,941
POWER FUEL SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE CARBURETOR

Clarence C. Herbert, Southgate; Thomas R. Johnson, Ann Arbor, and Anthony Verduce, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1974, Ser. No. 431,454
Int. Cl.² F02M *7/22*
U.S. Cl. 261—23 A **6 Claims**



1. A power fuel supply system for an internal combustion engine carburetor having at least two barrels and throttle valves pivotally mounted within said barrels,

said carburetor including a fuel bowl, a power valve receiving fuel from said fuel bowl, and first and second fuel passages receiving fuel from said power valve and discharging it into first and second of said barrels, respectively,

said power valve including a housing having a vacuum motor at one end thereof,

said vacuum motor having a variable volume chamber in communication with a source of engine intake manifold vacuum, said vacuum motor including a movable element displaceable in response to intake manifold vacuum pressure,

said power valve including a bore and a piston means slidingly received within said bore in engagement with said movable element,

said piston means having an inlet and an outlet openable to said first and second fuel passages,

said piston means being resiliently held in a first postion in which it blocks the outlet from the first and second fuel passages and the first fuel passage from the second fuel passage,

said piston means being movable by the vacuum motor to a second position in which the outlet is in communication with the first and second fuel passages,

a flow restrictor resiliently mounted within an opening in said housing and having an orifice to permit fuel flow from said fuel bowl to said piston means inlet,

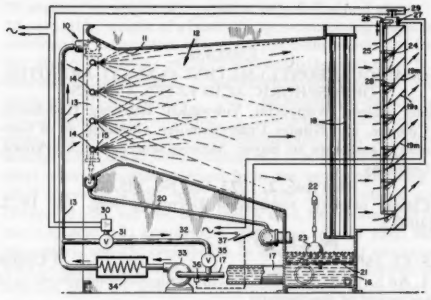
a throttle lever pivotally movable with said throttle valves, and motion transfer means interconnecting said restrictor and the throttle lever to displace said restrictor when the throttle lever reaches a predetermined position, said restrictor when displaced permitting increased fuel flow into said housing through said opening.

3,907,942
CONTROL SYSTEM FOR INJECTION COOLING TOWERS

Wilson E. Bradley, Jr., Ellicott City, and Edward N. Schinner, Silver Spring, both of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Division of Ser. No. 144,855, May 19, 1971, Pat. No. 3,785,626. This application Sept. 12, 1973, Ser. No. 396,647
Int. Cl.² B01D *3/04*
U.S. Cl. 261—27 **2 Claims**

1. An evaporative heat exchanger comprising an injector having means defining an air intake opening, an air and water mixing region, a region downstream of said air and water mixing region, means defining an exhaust opening, means to spray water into said air and water mixing region to induce air flow into said intake opening and flow concurrent with said water through said air and water mixing region and downstream region, means to collect the sprayed water, a return conduit connecting said collecting means to said spray means, a plurality of louvers extending across said exhaust opening, means mounting said louvers for pivotal movement from an open to a closed position, a bypass line in said return conduit, a normally closed valve in said bypass line, and means responsive to a predetermined position of said louvers to open said valve to reduce the water supply to said means to spray water.

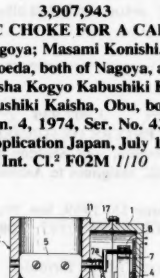


2. An evaporative heat exchanger comprising an injector having an intake region, an air and water mixing region, a region downstream of said air and water mixing region, means to spray water into said air and water mixing region, a water container for receiving the water issuing from said downstream region, means defining an air discharge opening from said downstream region, a plurality of dampers mounted for pivotal movement from an open to a closed position and an air bypass line leading from the region between said air and water mixing region and said dampers to any position upstream of the spray means to relieve the pressure between the air and water mixing region and said dampers when said dampers are at least partially closed.

3,907,943
AUTOMATIC CHOKE FOR A CARBURETOR

Hidenori Tateno, Nagoya; Masami Konishi, Toyoda; Hisaharu Arai, and Kenji Koeda, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda and Aisan Kogyo Kabushiki Kaisha, Obu, both of, Japan

Filed Jan. 4, 1974, Ser. No. 430,663
Claims priority, application Japan, July 13, 1973, 48-79508
Int. Cl.² F02M *1/10*
U.S. Cl. 261—39 B **7 Claims**



2. In combination with an automatic choke system for an internal combustion engine carburetor having a bimetallic coil in a housing for restraining the opening of a throttle valve in said carburetor, the improvement comprising: at least one pin secured at one end to said housing in proximity to said bime-

tallic coil, said bimetallic coil, upon heating thereof, being movable into contact with said pin to prevent vibration of said bimetallic coil.

3,907,944

CHOKE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

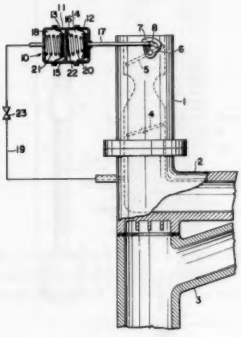
Masahiko Nakada, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed July 1, 1974, Ser. No. 484,872

Claims priority, application Japan, July 6, 1973, 48-75633

Int. Cl.[2] F02M *1/10, 1/14*

U.S. Cl. 261—39 R **7 Claims**



1. A choke valve control system for an internal combustion engine which includes an intake manifold and a choke valve, said control system comprising, in combination, a diaphragm box, a pair of diaphragms located within said box and spaced apart from each other to define within said box a liquid chamber therebetween, said liquid chamber being adapted to contain therein a liquid which will undergo viscosity change in accordance with changes in temperature, a partition wall within said box bisecting said liquid chamber, orifice means defined through said partition wall, a choke valve operating rod interconnected between one of said diaphragms and said choke valve, and movable through an operating stroke between positions into and out of driving engagement with said choke valve, a diaphragm chamber defined within said box by the other of said diaphragms on a side thereof opposite said liquid chamber, vacuum conduit means connected between said intake manifold and said diaphragm chamber, and spring means biasing both said diaphragms toward a direction tending to place said operating rod out of driving engagement with said choke valve whereby introduction of vacuum in said diaphragm chamber will be communicated through said liquid chamber to drive both said diaphragms in a direction tending to bring said operating rod into driving engagement with said choke valve.

3,907,945

CARBURETOR CONTROL MECHANISM

Nobuyuki Kobayashi; Mitsunori Sasano, and Masahiko Nakada, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

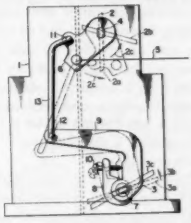
Filed July 11, 1974, Ser. No. 487,736

Claims priority, application Japan, Nov. 30, 1973, 48-133565

Int. Cl. F16k *11/22*

U.S. Cl. 261—52 **8 Claims**

1. A control mechanism for a carburetor including a choke valve and a throttle valve each operable to be moved between a closed position and an open position, said control mechanism comprising linkage means connecting said throttle valve with said choke valve to render said throttle valve movable toward its open position in dependence upon movement of said choke valve only when said choke valve moves toward its closed position, said linkage means including means for causing said throttle valve to be moved toward its open position at a relatively lower rate when said choke valve is moved toward



its closed position within a region near its closed position and means for causing said throttle valve to be moved toward its open position at a relatively higher rate when said choke valve is moved toward its closed position within a region near its open position.

3,907,946

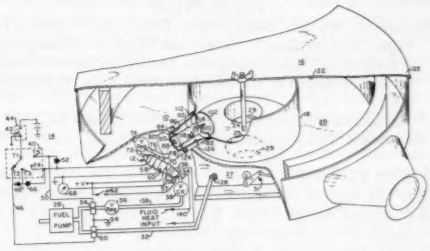
FUEL SYSTEM

David A. Brown, P.O. Box 341, Bay, Ark. 72411

Filed June 20, 1974, Ser. No. 481,194

Int. Cl. F02m *15/04*

U.S. Cl. 261—142 **10 Claims**



1. A fuel system for a gasoline fueled, spark-ignited internal combustion engine comprising:

fuel supply means;

liquid fuel heating means comprising means for receiving fuel from said fuel supply means and heating, vaporizing, and discharging it;

pressure regulating means having an inlet and an outlet, said inlet being coupled to the discharge of said fuel heating means, and including means for providing fuel vapor at said outlet at a selected pressure in the range of .2 to 2 PSI;

a vapor-fuel air carburetor comprising:

a vapor chamber having an inlet connected to the outlet of said pressure regulator and having a vapor outlet,

an elongated cylinder having an opening at one end coupled to said vapor outlet of said vapor chamber and, having at least one opening in a side wall thereof,

a cylindrical piston positioned within said cylinder and comprising:

a cylindrical body having a hollow interior and an opening at a first end cooperating with said opening in said cylinder and vapor outlet of said vapor chamber,

a slot extending through the wall of said cylindrical body, said slot being positioned along a longitudinal dimension of said piston and adapted to cooperate with said opening in said side wall of said cylinder,

whereby the passageway between the interior of said piston through said cylinder to the outside of said cylinder varies as said piston is moved longitudinally within said cylinder,

a piston-operating arm extending longitudinally from a second and opposite end of said piston,

an air-vapor mixing chamber surrounding said cylinder and extending beyond the end of said cylinder, opposite to the end of opening in said cylinder, and said mixing chamber having a plurality of outer openings through which air is admitted into said mixing chamber and an outlet opposite said second end of said piston through which last-named outlet a vapor-air fuel mixture is provided to a said engine;

valve means comprising:

closure means connected to said operating arm of said piston and responsive to vacuum applied by said engine for variably opening said outlet of said mixing chamber and simultaneously varying the passageway between the interior of said piston and said mixing chamber, and spring biasing means for applying a selected closing pressure to said closure means, whereby the degree of opening of said valve means is a function of the differential force between said vacuum and said spring biasing means,

whereby an engine being supplied by said carburetor is accelerated and a greater vacuum is drawn, said valve means will be proportionally opened by a greater amount.

3,907,947
METHOD FOR SHAPED CHARGE BOMBLET PRODUCTION

Herbert M. Neuhaus, Santa Monica, Calif.; Jack Sherman, Las Vegas, Nev.; Wallace E. Silver, and Lloyd A. Williams, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 160,072, June 24, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 413,399

Int. Cl.[2] C06B *21/00*

U.S. Cl. 264—3 R **4 Claims**

1. The method of manufacturing molded preformed explosive charges for placement within a shaped chamber in an explosive device comprising the steps of

forming an explosive powder mixture;

pouring a measured quantity of said explosive powder into a mold that has a central contoured cavity whose internal surface area defines the external shape of said charge;

applying pressure against said powder by means of a first punch having an external surface shape that defines the shape of the internal chamber of said charge;

supplying an opposing force against said powder by means of a second punch movable within said mold that has an external end surface that defines the external surface area of the closed end of said charge;

releasing the pressure against said charge; and

disassemblying said first and second punches from said mold to remove said charge from said mold cavity.

3,907,948
METHOD OF MAKING FUEL AND FERTILE ELEMENTS FOR NUCLEAR-REACTOR CORES

Ernö Gyarmati, and Hubertus Nickel, both of Juelich, Germany, assignors to Kernforschungsanlage Juelich, Juelich, Germany

Filed June 23, 1970, Ser. No. 49,056

Claims priority, application Germany, June 27, 1969, 1932567

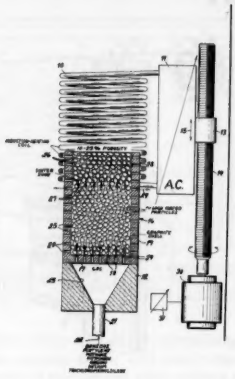
Int. Cl. G21c *21/02, 21/14*

U.S. Cl. 264—0.5 **3 Claims**

1. A method of making a fissionable fuel or fertile element containing pyrolytic-carbon coated or ceramic coated particles of fissionable fuel or fertile material having a particle size of 400 to 1,000 microns comprising the steps of:

A. Confining a mass of said particles in a perforated graphite shell,

B. Heating said particle mass with an axially displaceable indiction-furnace coil to the pyrolysis temperature of a pyrolytically decomposable gas stream comprising at least one carrier gas selected from nitrogen, argon, helium, or hydrogen and at least one compound selected from methane, acetylene, benzene, or trichloromethylsilane,



C. Flowing said gas stream up through said mass,

D. Relatively displacing said shell and said induction-furnace coil to form a pyrolysis front advancing counter to the direction of flow of said gas stream, and

E. Pyrolytically depositing pyrolytic carbon or silicon carbide from said gas stream to sinter bond said particles in said mass and to sinter bond said mass to the inner wall of said graphite shell thereby forming a coherent porous structure having a porosity of 10 to 25%, said porous structure containing pyrolytically deposited carbon or carbide bridges between said particles.

3,907,949
METHOD OF MAKING TUBULAR POLYCRYSTALLINE OXIDE BODY WITH TAPERED ENDS

William G. Carlson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 84,368, Oct. 27, 1970, abandoned. This application Nov. 8, 1972, Ser. No. 304,872

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—6 **8 Claims**

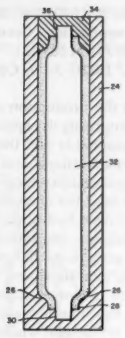
7. The method of making a tubular polycrystalline alumina body having end portions of smaller internal and external diameter than the mid portion thereof comprising the steps of: disposing a preshaped mandrel having end portions of smaller diameter than the central portion and formed of a metal having a melting point below 350°C, centrally of an outer mold form,

filling said mold form about said mandrel with alumina particles of predetermined size,

vibrating said mold form for several minutes to uniformly fill the space between the mold form and said mandrel with alumina particles,

isostatically pressing said particles at a predetermined pressure of about 9,000 psi removing the pressed alumina body containing the mandrel from the mold and heating the body in a non-oxidizing atmosphere while in a near

vertical orientation to thereby melt said mandrel and permit said mandrel metal to flow from said body, and



sintering the alumina body at a predetermined temperature for a predetermined time to thereby produce a translucent polycrystalline alumina body with tapered ends.

3,907,950

CARBON ARTICLES

Robert Lewis Bickerdike, and Garyth Hughes, both of Farnham, England, assignors to Minister of Technology in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 155,227, June 21, 1971, abandoned, which is a continuation of Ser. No. 653,682, July 17, 1967, abandoned. This application Apr. 10, 1972, Ser. No. 242,785

Claims priority, application United Kingdom, July 19, 1966, 32419/66

Int. Cl.[2] C01B *31/02, 31/04*

U.S. Cl. 264—29 **20 Claims**

1. In a process of making a carbon article wherein a blend of carbon particles and a polymerizable and carbonizable resin binder is shaped and the shaped material is heated in a nonoxidizing atmosphere to carbonize said resin, the improvement of producing a precisely shaped carbon article wherein the process comprises the following sequential steps:

a. mixing a carbon powder having a particle size of less than 200 mesh BSS with polymerizable and carbonizable resin binder and an evaporative solvent for the resin and continuing mixing until the solvent has essentially evaporated to obtain a fine powder mixture comprising carbon and not more than 14 percent by weight of said binder;

b. charging a mold with said powder mixture;

c. applying pressure of at least 800 pounds per square inch to the charge and heating the charge in the mold to cure the resin and bond the carbon with cured resin while the charge is held under a pressure of at least 800 psi to form a shaped charge;

d. removing the shaped charge from the mold;

e. heating the removed shaped charge in a non-oxidizing atmosphere at a temperature within the range of from 700°C – 1,100°C to carbonize the resin binder; and

f. heating the carbonized shaped charge in an atmosphere containing hydrocarbon to deposit carbon pyrolytically into the pores of the carbonized shaped charge,

to produce a high strength, precisely dimensioned, carbon article which, in production, has undergone at most only slight dimensional change after being formed as a shaped charge.

3,907,951

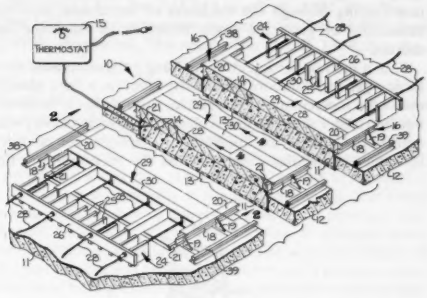
METHOD OF FORMING CONCRETE PANELS USING ELECTRICALLY HEATED MOLD

Fred Darroll Godley, Charlotte, N.C., assignor to Modular Wall Systems, Inc., Charlotte, N.C.

Filed Oct. 6, 1971, Ser. No. 186,837

Int. Cl.[2] B28B *23/04*

U.S. Cl. 264—40 **3 Claims**



1. A method of forming and curing cast building assembly panels comprising the steps of preparing a fluid mix of Portland cement and aggregate; pouring the fluid mix into a horizontal forming apparatus including an elongate cured concrete bed having electrical heating elements embedded therein; supporting the fluid mix on the cured concrete bed while confining the fluid mix between elongate side forms extending adjacent the cured concrete bed and while dividing the mix into a plurality of spaced apart, longitudinally aligned discrete panel lengths separated transversely by bulkheads; said dividing including forming each of said bulkheads by supporting a lower plate member on said bed, supporting a pair of side members on the lower plate member and inserting an upper plate member to overly and space apart upper portions of said side members, the side members being movable, upon removal of the upper plate member, between an upright molding position and a tilted release position; electrically energizing the embedded heating elements to heat the cured bed while sensing the temperature of the cured bed and controlling energization of the embedded heating elements in response to sensed temperatures for heating the cured concrete bed at a rate which avoids spalling thereof by thermal shock while accelerating curing of the fluid mix; and continuing to support the discrete panels on the cured concrete bed until the mix has cured.

3,907,952

INJECTION MOLDING TECHNIQUE

Kenneth J. Cleereman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 66,436, Aug. 24, 1970, which is a continuation of Ser. Nos. 800,810, Feb. 5, 1969, and Ser. No. 713,266, Feb. 16, 1968, which is a continuation-in-part of Ser. No. 498,622, Oct. 20, 1965, said Ser. No. 800,810, is a continuation-in-part of Ser. No. 565,665, May 24, 1966, which is a division of Ser. No. 318,748, Oct. 24, 1963, Pat. No. 3,307,726. This application Mar. 5, 1973, Ser. No. 338,269

Int. Cl.[2] B29C *5/04;* **B29D** *3/02;* **B29F** *1/08*

U.S. Cl. 264—40 **8 Claims**

1. A method for injection molding a thermoplastic article having general rotational symmetry to impart useful molecular orientation to the thermoplastic of said article, said method comprising injecting a heat plastified melt of molecularly orientatable, thermoplastic material into a closed mold with a cavity which defines said article while simultaneously rotating

at least one element of said mold, said injection step being under conditions to induce permanent generally preferred helicoidal molecular orientation, substantially through the wall of the article, thereafter, providing sufficient torque to continue rotatable movement of at least one element comprising said mold in the period after said cavity has filled, said rotational step imparting a strain on said article as it solidifies substantially through the thickness thereof, to the extent said article permanently accepts molecular orientation substantially through its entire thickness, the direction of the orientation varying through the thickness of the article, and being essentially of preferred hoop direction in an inner layer thereof.

7. In a method for injection molding a thermoplastic article having general rotational symmetry wherein a heat plastified melt of a molecularly orientatable, thermoplastic material is injected under pressure into a closed mold with a cavity which defines the article, the injection step being under conditions to induce molecular orientation as the thermoplastic flows

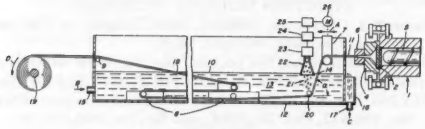
through the cavity, the improvement which comprises, controlling the level of the ultimate strength of the article by applying sufficient torque to rotatably move and controlling the intensity of the rotational movement of at least one element comprising said mold during the period after the mold cavity has filled with thermoplastic, maintaining controlled pressure on the article during the rotational step to cooperatively with said rotational step impart a resultant strain on said article as it solidifies substantially through the thickness thereof, to the extent said article permanently accepts molecular orientation substantially through its entire thickness, to thereby provide molecular orientation of controlled direction and magnitude substantial through the thickness of the article, and being essentially in a preferred hoop direction in an inner layer thereof.

3,907,953

CONTAINER CLOSURE AND METHOD

William R. Wheeler, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 18, 1972, Ser. No. 316,418
Int. Cl.[2] B29H *7/20;* **B65D** *53/00*
U.S. Cl. 264—54 **2 Claims**



1. A method of producing a foamed plastics product suitable as liner material for container closures, including the steps of extruding a molten polymer composition foamable at atmospheric pressure into an air space at atmospheric pressure and then into a liquid quenching agent for stopping foaming and for setting the composition, and wiping against the quenched composition, wherein the improvement comprises the step of maintaining the residence time of the composition in the air space as a function of bubbling from the composition during wiping.

3,907,954

PRODUCTION OF FIBERS CONTAINING SILICON-OXYGEN BONDS

Manfred Mansmann, and Gerhard Winter, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 8, 1972, Ser. No. 224,584
Claims priority, application Germany, Feb. 12, 1971, 2106728; Nov. 26, 1971, 2158582
Int. Cl.[2] D02G *3/00;* **C04B** *35/64*
U.S. Cl. 264—63 **10 Claims**

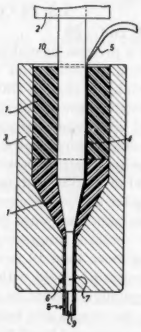
1. The process for the production of fibers containing silicon-oxygen bonds comprising dry spinning a solution comprising poly-lower alkylene oxide and the reaction product of at least one of a tetraalkoxysilane and alkoxypolysiloxane, at least one of an organoalkoxysilane and an organoalkoxypolysiloxane, and at least the amount of water stoichiometrically required for complete hydrolysis of all the alkoxy groups of the silanes and siloxanes, the tetraalkoxysilane plus alkoxypolysiloxane being present to the extent of about 5 to 99 mole % of the silanes plus siloxanes, the poly-lower alkylene oxide having a degree of polymerization above about 5,000 and being present in the spinning solution in a concentration of about 0.01 to 2% by weight, whereby there is produced a fiber containing silicon-oxygen bonds and some silicon-carbon bonds.

3,907,955

PROCESS FOR MANUFACTURING ELECTRICALLY CONDUCTIVE POLYTETRAFLUOROETHYLENE TUBE

Pierre Viennot, Clamart, France, assignor to Aeroquip A.G., Zug, Switzerland

Filed July 24, 1973, Ser. No. 382,172
Claims priority, application France, Aug. 1, 1972, 72.27682
Int. Cl.[2] B29D *23/04;* **F16L** *11/12;* **H05F** *3/00*
U.S. Cl. 264—105 **5 Claims**



1. In a process for the manufacture of polytetrafluoroethylene tubes having a conductive zone by placing in an extrusion press a cylindrical preform and a mixture containing an electrically conductive pulverulent material the improvement of using a single preform of pure polytetrafluoroethylene, said preform having continuous channels parallel to the axis thereof and of small cross-section, and at the moment of extrusion flowing without pressure into the said channels an aqueous dispersion of tetrafluoroethylene polymer containing up to 50 percent by weight of said pulverulent conductive material and extruding the preform.

3,907,956

METHOD OF AGGLOMERATING GLASS BATCH MATERIALS IN A FLUIDIZED BED

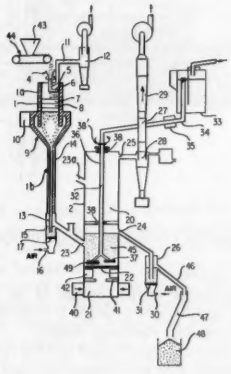
Georges Meunier, Chalon-sur-Saone, France, assignor to Saint-Gobain Industries, Neuilly, France

Filed July 15, 1974, Ser. No. 488,793

Claims priority, application France, July 24, 1973, 73.27022

Int. Cl.[2] B01J *2/16*; C03C *1/02*, *3/04*

U.S. Cl. 264—117 12 Claims



1. Method for making an agglomerated composition for use in glassmaking which method comprises simultaneously

a. fluidizing, by means of a gas, a bed of preheated sand granules,

b. injecting from a distribution head located within the fluidized bed an aqueous solution of an alkali metal hydroxide and

c. mechanically agitating the fluidized bed at the level of said injecting step by means of a rotating raking device, the reaction temperature of said fluidized bed being at least 320°C and up to about 400°C.

3,907,957

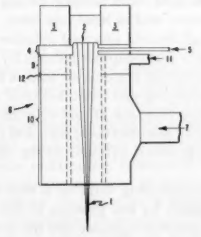
QUENCHING PROCESS FOR MELT EXTRUDED FILAMENTS

Donald Edward Shaffer, Chattanooga, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 370,678, June 18, 1973, abandoned. This application Apr. 18, 1974, Ser. No. 462,036

Int. Cl.[2] D01D *5/08*

U.S. Cl. 264—176 F 9 Claims



1. A process for quenching a melt extruded filament issuing from a spinning pack which comprises introducing immediately below the spinning pack in successive first, second and third zones steam, noncondensible inert gas, and air respectively; and passing the melt extruded filament through said zones to quench the filament.

3,907,958

HIGHLY FLAME-RETARDANT SHAPED ARTICLES AND METHOD FOR PREPARING THE SAME

Tadashi Tsuji, and Mikio Korematsu, both of Yatsushiro, Japan, assignors to Kabushiki Kaisha Kohjin, Shinba, Japan

Division of Ser. No. 242,745, April 10, 1972, Pat. No. 3,859,390, and a continuation-in-part of Ser. No. 43,977, June 5, 1970, abandoned. This application Oct. 8, 1974, Ser. No. 513,200

Int. Cl. C08f *29/24*

U.S. Cl. 264—184 2 Claims

1. A method for producing shaped articles having durable, highly flame-retardant properties which comprises a chlorine-containing polymer and partially acetalized polyvinyl alcohol, as principal constituents, in a weight ratio of 2:8 to 8:2 and 0.1 to 15% of tin substantially in the form of stannic acid based upon the total weight of the above-mentioned principal constituents, which method comprises mixing an aqueous emulsion of a chlorine-containing polymer, an aqueous solution of polyvinyl alcohol and an aqueous dispersion of stannic acid to give a dope having a ratio of polyvinyl alcohol to said chlorine-containing polymer of 2:8–8:2 and a stannic acid content of 0.15–5 percent per total weight of polymers and extruding said dope into a coagulating bath to obtain coagulated shaped articles, followed by conventional after-processing including insolubilizing of polyvinyl alcohol by acetalization, said chlorine-containing polymer being a member selected from the group consisting of polymers of vinyl chloride, vinylidene chloride, chloroprene, copolymers of the foregoing compounds, copolymers of any of these compounds with other monomers copolymerizable therewith, chlorinated polyvinyl chloride, chlorinated polyethylene, chlorinated poly-propylene and polymer-blends of the foregoing polymers.

3,907,959

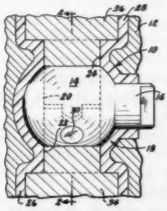
METHOD OF MOLDING A VALUE WITH ROTATABLE MEMBER

Eugene H. Wise, Saugus, and Homer W. Galt, Burbank, both of Calif., assignors to R & G Sloane Manufacturing Company, Inc., Woodland Hills, Calif.

Division of Ser. No. 116,210, Feb. 17, 1971, Pat. No. 3,712,584, which is a continuation of Ser. No. 857,058, Sept. 11, 1969, abandoned. This application Nov. 8, 1972, Ser. No. 304,752

Int. Cl.[2] B29D *3/00*

U.S. Cl. 264—242 6 Claims



1. A method of forming a valve having a valve member with a passageway therethrough rotatably mounted with a substantially rigid plastic valve body having inlet and outlet passages, said method comprising the steps of:

forming a recessed portion on the outer surface of the valve member,

positioning the valve member in the open position within a mold cavity having a configuration complementary with the configuration of the valve body,

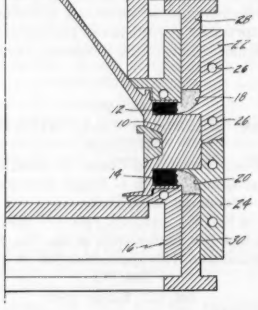
forming a substantially rigid raised portion on the inner surface of the molded valve body that is complementary with said recessed portion of the valve member by introducing plastic material into said mold cavity to mold the valve body about the valve member,

said recessed portion and raised portion being shaped and positioned such that said valve member is rotatable from an open to a closed position and when said valve member is thereafter rotated from the open position to a closed position, said recessed portion is moved out of engagement with said raised portion and said raised portion is in tight engagement with the outer surface of the valve member to prevent leakage between the valve body and the valve member when the latter is in the closed position, the forming method resulting in a valve in which said valve member can rotate within said valve body.

3,907,960
METHOD FOR PRODUCING A SUBSTANTIALLY VOIDLESS FILAMENT REINFORCED RESIN MATRIX COMPOSITE

Karl Severin Jakobsen, Somers, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 1, 1972, Ser. No. 302,976
Int. Cl. B29d *3/02*; **B31c** *13/00*
U.S. Cl. 264—273 **2 Claims**



1. In a process for producing a gas turbine engine disk having at least one composite of high modulus, high strength filaments hoop wound about a circumference thereof and embedded in a high temperature resin matrix, a method for making said composite substantially voidless comprising:

applying filament reinforced uncured resin matrix composite windings about a circumferential surface of said disk, said resin matrix being at least partially desolvated and containing voids;

positioning said disk coaxially within a female mold member so that an outer circumferential surface of said disk forms an annular mold cavity with an inner surface of said female mold member;

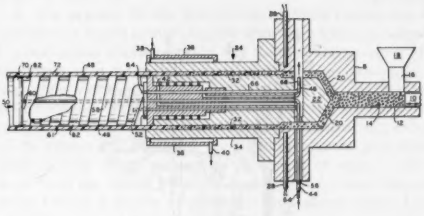
filling a remaining portion of said mold with dry uncured resin powder, said powder being of the same resin as the matrix;

applying heat to said mold sufficient to melt said resin and moving a ring-like plunger axially in an annular cavity communicating with said annular mold cavity, to apply pressure uniformly and radially to the periphery of said matrix and to cause said resin to infiltrate said matrix and to fill said voids.

3,907,961
FLEXIBLE CYLINDER FOR COOLING AN EXTRUDED PIPE

Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 28, 1974, Ser. No. 436,977
Int. Cl.[2] B29C *17/06*, *25/00*; **B29F** *3/08*; **B29C** *23/00*
U.S. Cl. 264—314 **12 Claims**



1. Apparatus for cooling an extruded pipe, said apparatus comprising:

a flexible cylinder;

annular discharge orifice means of an extrusion means wherein said flexible cylinder is coaxially disposed adjacent said annular discharge means;

means for passing a fluid to said flexible cylinder for cooling said extruded pipe and pressurizing said flexible cylinder; said flexible cylinder having a leading end, a trailing end, an inner surface and an outer surface, said leading end being attached to said annular discharge means, said trailing end having a plug-like end portion, said outer surface interconnecting said ends and having a portion with at least one groove and at least one land, said plug-like end portion of said trailing end and said land portion of said outer surface cooperating to form a fluid seal with the inner surface of the extruded pipe as the extruded pipe is passed over said flexible cylinder and said flexible cylinder is pressurized;

a chamber formed by said ends and said inner surface;

an aperture for passing said cooling fluid located near said trailing end and in the grooved portion of said outer surface of said cylinder;

an aperture for passing a cooling fluid located near said leading end and in the grooved portion of said outer surface of said cylinder; and

an aperture in said leading end for passing a pressurizing fluid to pressurize said chamber.

6. A method for cooling an extruded pipe comprising the steps of:

passing an extruded pipe over the outer surface of a flexible grooved cylinder, said flexible grooved cylinder having an outer grooved surface, an inner surface, a leading end and a trailing end, said outer surface having a portion with at least one groove and at least one land;

pressurizing said flexible grooved cylinder by passing sufficient fluid to a first chamber formed by the inner surface and the ends of said cylinder to form a fluid seal between the inner surface of said extruded pipe and the land portion of the outer surface of said cylinder and between the inner surface of said extruded pipe and the end portion of said flexible grooved cylinder in the direction of extrusion;

passing said pressurizing fluid to a first end of a second chamber formed by the grooves in the outer surface of the flexible grooved cylinder and the inner surface of the extruded pipe to cool said pipe; and

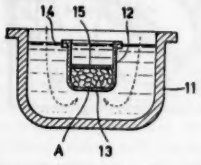
removing the fluid from said second chamber through a conduit in open communication with a second end of said chamber.

3,907,962

METHOD OF PREPARING A FILTER MEDIUM FOR THE FILTRATION OF MOLTEN ALUMINUM OR A MOLTEN ALUMINUM ALLOY

Koichi Ogiso, 25 Tashiden, Daito, Osaka-fu, Japan

Continuation-in-part of Ser. No. 842,294, July 16, 1969, abandoned. This application Feb. 17, 1972, Ser. No. 227,303
Int. Cl. C04b 35/60
U.S. Cl. 264—332 11 Claims



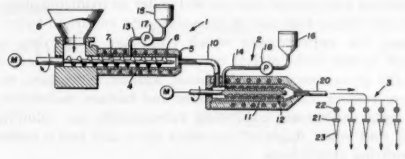
1. A method of preparing a filter medium for the filtration of molten aluminum or a molten aluminum alloy comprising the steps of using more than two halogenide compounds, of which at least one halogenide is selected from the group consisting of compounds of sodium fluoride, potassium chloride, silver chloride, potassium fluoride and sodium nitrate, and of which the second halogenide is selected from the group of compounds having a melting point of more than 1000°C consisting of calcium fluoride, magnesium fluoride, aluminum fluoride, barium chloride, cryolite, and cerium fluoride and mixtures thereof; heating said compounds until they are molten and then mixing thoroughly with some agitation to obtain a homogeneous melt and subjecting the thus obtained melt to a molding step.

3,907,963

MELT EXTRUSION

Lawrence E. Blackmon, Foley, Ala., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 168,286, Aug. 2, 1971, abandoned. This application June 29, 1973, Ser. No. 375,228
Int. Cl.² B29B 1/04
U.S. Cl. 264—349 3 Claims



1. In the process of incorporating a wax into polyamide filaments including the steps of melting polyamide in solid particulate form and conveying the resulting molten polymer in a confined zozne, injecting a polyalkoxylated wax compound into the molten polyamide in the amount of about 2–10 percent by weight, and thereafter extruding the resulting mixture into textile continuous filaments, the improvement comprising subjecting the mixture of molten polyamide and wax compound before extrusion to a plurality of intensive scissor shearings (intermittently interrupted by) in alternation with longer periods of substantially no shearing, whereby the wax compound is dispersed as a separate and distinct phase in the filaments with an elongated rod size of 0.05 to 3 microns in diameter and 15–50 microns in length.

3,907,964

CATALYST FOR ELIMINATION OF POLLUTANTS IN AUTO-EXHAUST GAS

Robert Henry Whitman, Stamford, Conn., and Louis Leonard Lento, Jr., Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 254,593, May 18, 1972, Pat. No. 3,819,534. This application Jan. 25, 1974, Ser. No. 436,828
Int. Cl.² B01D 53/34
U.S. Cl. 423—213.2 7 Claims

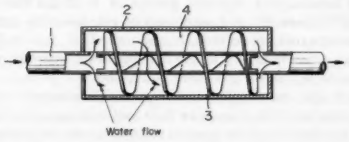
1. A process for oxidizing carbon monoxide and hydrocarbons in exhaust gases emanating from internal combustion engines which comprises contacting said gases with a catalyst composition comprising a calcined support material selected from alumina, silica, magnesia, zirconia, and mixtures thereof containing deposited on said support from about 1.5% to about 10% of an alkaline earth metal oxide selected from calcium, barium, strontium, and mixtures thereof, from about 0.5 to about 40% of chromic oxide, and from about 1% to about 12% of copper oxide, said percentages being by weight based on the weight of the calcined support and said catalyst composition having a 50% conversion temperature for hydrocarbons of about 650°F. or less, a 50% conversion temperature for carbon monoxide of about 550°F. or less, and a shrinkage of 14% or less under conditions of use.

3,907,965

METHOD OF PREVENTING SURFACE FLAWS ON STEEL STRIP PRODUCED IN PRE-TREATMENT FURNACE OF CONTINUOUS HOT-DIPPING PROCESS

Yoshio Hoshino, Tokyo; Masahiko Nagakuni, and Takeshi Murayama, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 28, 1973, Ser. No. 374,342
Int. Cl.² F27D 3/00; C23C 1/00
U.S. Cl. 432—235 3 Claims



1. In a continuous hot-dip metal coating process, a method of preventing surface flaws on a traveling steel strip workpiece caused by deposits of metallic oxides on hearth rolls within a heat treating furnace formed by previous workpieces traveling through the hearth rolls comprising cooling said hearth rolls with a cooling fluid during said heat-treating so that the temperature of said hearth rolls do not exceed 200° C. by feeding a stream of water through the roll axis and spirally rotating said stream of water through the inside of said hearth rolls so that the water cools the periphery of said hearth rolls to said maximum temperature of 200° C.

3,907,966

NICKEL EXTRACTION AND STRIPPING USING OXIMES AND AMMONIACAL CARBONATE SOLUTIONS

Roald R. Skarbo, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 266,981, June 28, 1972, Pat. No. 3,855,090, and a continuation-in-part of Ser. No. 266,985, June 28, 1972, Pat. No. 3,853,725. This application July 19, 1973, Ser. No. 380,792
Int. Cl. C01G 53/12
U.S. Cl. 423—139 4 Claims

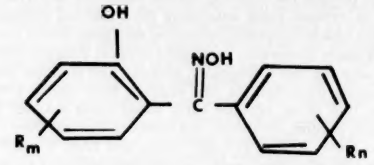
1. Nickel recovery process comprising

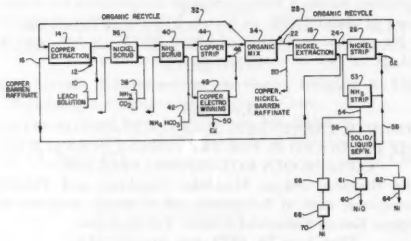
providing an aqueous feed phase comprising nickel metal values in ammoniacal solution and adjusting the ammonia concentration therein to 20–60 grams per liter,

contacting said feed with an immiscible organic chelating, ion exchange phase comprising a benzophenoxime to effect hydrogen ion-metal ion exchange between the two phases and loading the organic phase with nickel ion,

contacting said loaded organic phase with an ammonia containing aqueous stripping phase to effect stripping of nickel ions from said loaded organic phase into said aqueous stripping phase, and

recovering nickel values from said aqueous stripping phase, and wherein said benzophenoxime has the formula:





in which R and R′ may be individually alike or different and are saturated aliphatic groups of 1–25 carbon atoms, ethylenically unsaturated aliphatic groups of 3–25 carbon atoms or —OR″ where R″ is a saturated or ethylenically unsaturated aliphatic group as defined, *m* and *n* are 0, 1, 2, 3 or 4 with the proviso that both are not 0 and the total number of carbon atoms in R_m and R'_n is from 3–25, and

said aqueous stripping solution has an ammonia concentration 80–200 grams per liter and said aqueous feed solution has a carbon dioxide content of 10–50 grams per liter and said aqueous strip solution has a carbon dioxide content of 50–100 grams per liter.

3,907,967

METHOD OF PURIFYING GASES USING ROTATABLE PLATES HAVING A SOLID REACTION SURFACE LAYER THEREON

Peter Filss, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

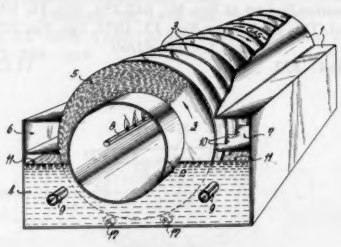
Filed July 19, 1973, Ser. No. 380,619

Claims priority, application Germany, July 25, 1972, 2236389

Int. Cl.² B01D *53/00*

U.S. Cl. 423—210 **7 Claims**

1. A method of purifying gases, especially industrial waste gases, by means of rotatable plates axially spaced from each other by a few millimeters and partially immersed into a liquid for forming an adsorption layer on the plates wetted by said liquid for adsorbing impurities from the gas to be purified, which includes in combination the steps of: employing as liquid an aqueous solution adapted on those portions of the rotatable plates which during the rotation thereof are above the level of the liquid to form a solid surface layer capable to adsorb impurities and harmful substances from the gas to be purified between the respective plate portions which during rotation of the latter are above the level of the liquid, rotating the plates, forming the solid surface layer, feeding impure gas between the plates, and removing impurities and harmful substances adsorbed by said solid surface layer from said plates and replacing exhausted portions of said layer by a fresh



forming solid layer by immersing the plate portions into said liquid, said solid surface layer being operable to chemically react with and bind impurities and harmful substances in the gas to be purified and passing between said plates.

3,907,968

PROCESS FOR REDUCING THE CONTENT OF NITROGEN OXIDES IN A GASEOUS MIXTURE CONTAINING THE SAME

Thaddeus P. Kobylinski, Cheswick, and Brian W. Taylor, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1972, Ser. No. 319,359The portion of the term of this patent subsequent to Jan. 8, 1991, has been disclaimed.

Int. Cl.² B01D *53/34*

U.S. Cl. 423—213.5 **18 Claims**

1. In a process wherein a mixture containing an exhaust gas from an internal combustion engine that includes nitrogen oxides, carbon monoxide and unburned hydrocarbons and added oxygen is passed over a first catalyst bed during the initial stages of operation of said internal combustion engine under an oxidizing atmosphere to oxidize said carbon monoxide and said unburned hydrocarbons and the treated mixture is then passed over a second catalyst bed containing an oxidation catalyst, upon continued operation of said internal combustion engine solely said exhaust gas from said internal combustion engine is passed over said first catalyst bed under a reducing atmosphere to convert said nitrogen oxides to nitrogen and the latter treated mixture and added oxygen are then passed over said second catalyst bed under an oxidizing atmosphere to oxidize said carbon monoxide and unburned hydrocarbons, the improvement which comprises employing as catalyst in said first catalyst bed a metal ruthenate selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, calcium, strontium and barium ruthenates, said metal ruthenates exhibiting substantially no volatility during said initial stages of operation when said bed is under an oxidizing atmosphere.

3,907,969

SEPARATION OF CO_2 FROM GAS MIXTURES

Joseph H. Field, Pittsburgh, Pa., assignor to The Benfield Corporation, Berwyn, Pa.

Filed June 28, 1974, Ser. No. 484,116

Int. Cl.² B01D *53/34*

U.S. Cl. 423—223 **14 Claims**

7. A method of absorbing CO_2 from gas mixtures comprising the steps of contacting such gas mixtures with an aqueous solution which contains from 15 to 40% by weight of potassium carbonate, from 2 to 15% by weight of equivalent KBO_2, from 0.5 to 5% by weight of equivalent V_2O_5, and in which the weight ratio of equivalent KBO_2 to equivalent V_2O_5 is at least 1.5:1.

3,907,970

PROCESS FOR REMOVING SULFUR DIOXIDE FROM GAS STREAMS CONTAINING SAME AND ESPECIALLY FURNACE AND CHEMICAL PLANT WASTE GASES

Guenter Boening, Bergen-Enkheim, Germany, assignor to Metallgesellschaft Aktiengesellschaft, 14, Reuterweg, 6 Frankfurt am Main, Germany

Filed July 9, 1973, Ser. No. 377,734

Claims priority, application Germany, July 18, 1972, 22351231

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 1 Claim

1. In a process of removing SO_2 from gases in which the SO_2-containing gas is catalytically reacted in the presence of water and oxygen to form sulfuric acid, which is washed out of the catalyst by continuously or intermittently spraying the same with water or dilute sulfuric acid, the SO_2-containing gas is cooled by direct contact with the drained sulfuric-acid before the SO_2-containing gas is catalytically reacted, and the sulfuric acid is concentrated by the evaporation of water therefrom, the improvement in which the SO_2-containing gas is conducted from bottom to top through two layers of carbon-containing catalyst in a common tower, wherein the lower bed of catalyst is composed of a plurality of adjacent layers of the catalyst on respective horizontal trays, and comprising the steps wherein said lower bed of catalyst is replaced by horizontally removing said trays and replacing them with trays carrying fresh carbon containing catalyst without interrupting the continuity of gas flow through said beds and wherein the volume of said lower bed is 5 to 20% of the volume of the upper bed, said lower bed consisting of a carbon containing granular catalyst larger in particle size than that of said upper bed, the lower bed of carbon containing granular catalyst being periodically and directly washed with liquid independently of the upper bed without interrupting the continuity of gas flow through the beds.

3,907,971

METHOD OF REMOVING HF FROM GASES

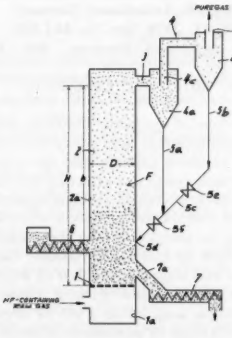
Eberhard Bohm, Frankfurt am Main; Lothar Reh, Bergen-Enkheim; Ernst Weckesser; Gunter Wilde, both of Grevenbroich, and Gunter Winkhaus, Cologne, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Vereinigte Aluminiumwerke Aktiengesellschaft, Bonn, both of, Germany, part interest to each

Filed Nov. 15, 1971, Ser. No. 198,768

Claims priority, application Germany, Nov. 14, 1970, 2056096

Int. Cl. B01d *53/34*

U.S. Cl. 423—240 2 Claims



1. A process for removing hydrogen fluoride from a gas stream by treating the gas stream with a solid having an affinity for the hydrogen fluoride, said method comprising the steps of:

fluidizing a column of particles having an average particle size of 20 to 300 microns of a solid selected from the group consisting of fine-grain alumina, sodium aluminate and mixtures thereof with a gas stream containing said hydrogen fluoride in an amount upwards of 20 mg/m^3 STP, said gas stream being introduced at a rate sufficient to provide a gas velocity within the column which is 1 to 5 meters/second to produce and maintain an expanded fluid bed with a continuous solids-concentration gradient extending over the entire length of the column from the gas inlet of the bed to the gas outlet thereof and substantially free from a demarcation between a layer of said solid and free space, the temperature of the gas introduced into said bed being adjusted to substantially 50° to 100°C;

withdrawing the fluidizing gas upon passage through said bed together with a main proportion of solids upwardly discharged therefrom in entrainment with the withdrawn gas;

separating the solid particles from said withdrawn gas by cyclone sedimentation and discharging a purified gas substantially free from HF; and

recycling the separated particles to said fluid bed in an amount of 5 to 100 times the solids content of the fluidized bed.

3,907,972

ABSORBING SO_2 WITH POLYACRYLIC ACID SOLUTION

Adin Lee Stautzenberger, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,995

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—243 6 Claims

1. In the recovery of sulfur dioxide (SO_2) from an SO_2-containing gas with an aqueous absorbing solution, thereafter treating said solution to remove the SO_2 therefrom at least in part followed by re-cycling the SO_2-freed absorbing solution, the improvement which comprises employing as said absorbing solution an aqueous solution of a polyacid of a molecular weight of at least about 200 and comprising predominantly at least one member of the group consisting of polyacrylic acid, polymethacrylic acid, and copolymers of acrylic acid and methacrylic acid.

3,907,973

PROCESS FOR DEFLUORINATING PHOSPHORIC ACIDS AND PRODUCTION OF AMMONIUM FLUOSILICATE AND FLUOSILICIC ACID

Gustave E. Kidde, 294 California Ter., Pasadena, Calif. 91105

Continuation-in-part of Ser. No. 231,826, March 6, 1972, abandoned. This application May 14, 1973, Ser. No. 359,765

Int. Cl. C01b *33/20;* C01c *1/00*

U.S. Cl. 423—341 9 Claims

1. A process for removing fluorine from phosphoric acid solutions comprising:

combining unconcentrated, fluorine-containing phosphoric acid with colloidal silica to form a slurry having a colloidal silica concentration of at least about 1% by weight;

heating said slurry;

subjecting said slurry to reduced pressures thereby volatilizing said fluorine into a vapor stream in the form of silicon tetrafluoride and thus removing a substantial portion of said fluorine from said phosphoric acid; and

scrubbing said vapor stream with an aqueous scrubbing solution containing ammonium bifluoride, to thereby convert said silicon tetrafluoride to ammonium fluosilicate and fluosilicic acid.

3,907,974

CURABLE DECORATING SYSTEMS FOR GLASS OR METAL CONTAINERS

Donald R. Smith, Dover, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 8, 1973, Ser. No. 413,908
Int. Cl.[2] B44C 1/16; B41M 3/12; B32B 7/10
U.S. Cl. 428—346 16 Claims

1. A stable heat transfer decoration comprising in combination a temporary carrier having a release surface from which the transfer is readily releaseable at elevated transfer temperature, and removably adhered to said surface in sequence a transfer lacquer layer, at least one design print layer, and a heat-activatable adhesive layer, wherein at least said transfer lacquer and design print layers adjacent to and in contact with each other contain cross-linkable resin means for forming cross-linked polymers, at least one of said two adjacent layers containing cross-linking agent means for cross-linking with said resin means in both layers, said agent means being stable at room temperature and activatable at elevated temperature to cross-link with said resin means within said one layer and between the two contacting layers, said resin and agent means being present in amounts effective to increase the abrasion and chemical resistance of the transfer decoration after application to a receiving surface and activation at elevated temperature.

12. The method of decorating a heat resistant surface of glass or metal comprising the steps of transferring to said surface from a release surface of a temporary carrier, under and heat and pressure, a decoration comprising in sequence a transfer lacquer layer, at least one design print layer, and a heat-activatable adhesive layer which is non-tacky at room temperature, wherein at least said transfer lacquer and design print layers adjacent to and in contact with each other contain cross-linkable resin means for forming cross-linked polymers, at least one of said two adjacent layers containing cross-linking agent means for cross-linking with said resin means in both layers, said agent means being stable at room temperature and activatable at elevated temperature to cross-link with said resin means within said one layer and between the two contacting layers, immediately stripping the temporary carrier from said layers, and curing said resin and agent means in said layers at a temperature between about 200°F and about 450°F to form a cross-linked structure within and between said layers, whereby an adherent cross-linked decoration is provided with improved resistance to abrasion and chemicals.

3,907,975

CATALYTIC OXIDATION OF AMMONIA

Michel Sénés, Saint Nazaire; Pierre Lhonoré, Douai; Michel Pottier, Saint Nazaire, and Jacques Quibel, Maisons Laffitte, all of France, assignors to Societe Chimique de la Grande Paroisse et Produits Chimiques, Paris, France

Division of Ser. No. 112,879, Feb. 5, 1971, abandoned. This application Apr. 11, 1973, Ser. No. 350,187
Claims priority, application France, Feb. 9, 1970, 70.04454
Int. Cl.[2] C01B 21/26
U.S. Cl. 423—404 12 Claims

1. In a method for the catalytic oxidation of ammonia comprising passing a mixture of ammonia and air over a catalyst under ammonia oxidation conditions, the improvement wherein said catalyst comprises:

a composition, containing no members of the platinum group, with limited porosity, with specific surface area between 0.02 and $2m^2/g$, wherein said composition consists essentially of metallic oxides consisting of iron oxide, vanadium oxide and at least one further metallic oxide selected from the group consisting of oxides of nickel, cobalt, and bismuth, and a refractory material consisting of magnesia, silica, zirconia or a mixture thereof, all combined by mixing the powdered constituents, compressing at 1,000–10,000 bars and sintering at 1300°C or higher.

3,907,976

CONTINUOUS PROCESS FOR PREPARING POTASSIUM FLUOTANTALATE CRYSTALS

Isaac R. Hogan, Jr., East St. Louis, and Ervin B. Inskip, Edwardsville, both of Ill., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Nov. 29, 1974, Ser. No. 527,981
Int. Cl.[2] C01G 35/00; C01D 3/02
U.S. Cl. 423—464 7 Claims

1. A continuous process for preparing potassium fluotantalate crystals having a density of from about 10 pounds/gallon to about 25 pounds/gallon, a particle size such that no more than about 10% pass through a −325 U.S. standard mesh screen and having occluded moisture present in an amount less than 0.04% by weight, based on the total weight of the crystals, which comprises

A. forming a reaction mixture in which crystals of potassium fluotantalate form by continuously mixing (1) an aqueous solution of a potassium compound having a temperature of from about 20° C. to about 40° C. and (2) an aqueous solution of fluotantalic acid having a temperature of from about 20° C. to about 40° C. at a rate such that the potassium compound is present in the reaction mixture in an amount which about equals or slightly exceeds the stoichiometric amount needed to react with the fluotantalic acid present in said reaction mixture

B. removing said reaction mixture containing potassium fluotantalate crytals.

3,907,977

METHOD FOR THE PREPARATION OF HIGH PURITY, HIGHLY SURFACE ACTIVE $LiASF_6$

Robert A. Wiesboeck, Stone Mountain, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 327,357, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 194,563, Nov. 1, 1971, abandoned, which is a division of Ser. No. 33,883, May 1, 1970, Pat. No. 3,654,330, which is a continuation-in-part of Ser. No. 829,111, May 29, 1969, Pat. No. 3,594,402. This application Apr. 25, 1974, Ser. No. 464,272
Int. Cl.[2] C01B 9/08; C01D 15/04; C01B 27/00
U.S. Cl. 423—464 2 Claims

1. A process for the preparation of high purity, highly surface active $LiAsF_6$, which comprises,

effecting the evolution and removal of substantially all the CH_3CN from a $Li(CH_3CN)_4AsF_6$ complex, said evolution being achieved at a pressure of less than about 20 mm Hg, while maintaining the temperature thereof within the range of 0° to 80°C.

3,907,978

PRODUCTION OF SYNTHETIC FLUORSPAR

Bernhard Spreckelmeyer, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1974, Ser. No. 441,546
Claims priority, application Germany, Feb. 17, 1973, 2307897
Int. Cl.[2] G01F 11/22; C01B 33/12
U.S. Cl. 423—490 5 Claims

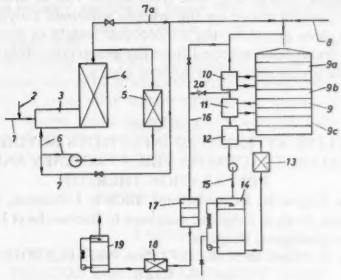
1. In the production of synthetic fluorspar low in SiO_2 wherein aqueous hexafluosilicic acid is reacted with calcium carbonate, and the resulting calcium fluoride is filtered off, the improvement which comprises effecting the reaction by adding the hexafluosilicic acid to an aqueous suspension of the calcium carbonate at a temperature of about 0° to 40°C, there being present during the reaction at least about three times as much water by weight as calcium carbonate, the reaction being carried out in two stages, in the first of which the calcium carbonate suspension is reacted with a stoichiometric excess of hexafluosilicic acid up to a pH of about 2 to 3, followed in the second stage by adjustment of the pH to about 4 to 6 by the addition of calcium carbonate, whereby the SiO_2 produced in the reaction is in the form of an aqueous sol from which the fluorspar can readily be separated by filtration.

3,907,979

LOW SO_2 EMISSION SULFURIC ACID PROCESS FORM SULFUR AND OXYGEN

Ernst Jenniges, Cologne-Hohenberg, Germany, assignor to Chemiebau Dr. A. Zieren GmbH & Co. KG, Cologne-Mungersdorf, Germany

Filed May 14, 1973, Ser. No. 359,726
Claims priority, application Germany, May 12, 1972, 2223131
Int. Cl.[2] C01B 17/76, 17/54
U.S. Cl. 423—522 11 Claims



1. A process for the production of sulfuric acid from sulfur and an oxygen-containing gas containing at least 40% by volume molecular oxygen comprising reacting the sulfur with said gas at about 900–3,000° C., to form an SO_2-containing combustion gas; oxidizing said combustion gas with oxygen in a main contact oxidation stage to form an SO_3-containing contact gas, absorbing said sulfur trioxide in a main absorption step to form a residual SO_3-lean gas; branching said SO_3-lean gas into portions thereof; heating and passing a first portion thereof into said main contact stage in admixture with said SO_2-containing, combustion gas an oxygen, heating a second portion of said SO_3-lean gas to a temperature less than that of said first portion and passing only heated second portion of SO_3 lean gas to a postcontact oxidation stage to convert residual SO_2 to SO_3, and subjecting resultant SO_2 depleted gas to a supplemental post-contact absorption step, said post-contact oxidation stage and supplemental post-contact absorption steps being conducted in equipment similar to, but separate and distinct from, and physically smaller than comparable equipment provided for the main contact oxidation stage and the main absorption step respectively.

3,907,980 Hydrogen generation

THERMO-ELECTROCHEMICAL PROCESS FOR PRODUCING HYDROGEN AND OXYGEN FROM WATER

Jon B. Pangborn, Lisle, Ill., assignor to American Gas Association, Inc., Arlington, Va.

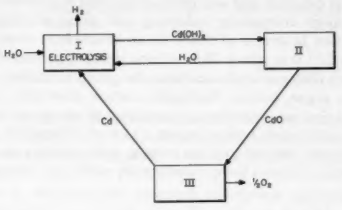
Filed Oct. 24, 1973, Ser. No. 409,029
Int. Cl. C01b 4/10, 13/04
U.S. Cl. 423—579 17 Claims

1. In a reactant regenerative closed cycle process for the production of hydrogen and oxygen from water the steps comprising:

electrolytically hydrolyzing in an aqueous electrolyte solution a porous crystalline cadmium anode produced by condensation of gaseous cadmium to form cadmium hydroxide and hydrogen;

thermally decomposing said cadmium hydroxide to cadmium oxide at temperatures of about 300° to about 800° C.; and

thermally decomposing said cadmium oxide to cadmium and oxygen at temperatures of about 800° to about 1,400° C. and condensing the gaseous cadmium to a porous



crystalline solid for use as an anode the primary energy input requirement of said process being thermal.

3,907,981

METHOD FOR RECOMBINING HYDROGEN AND OXYGEN

James O. Henrie, Hidden Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 12, 1973, Ser. No. 340,148
Int. Cl. C01b 5/00
U.S. Cl. 423—580 5 Claims

1. A continuous method of thermally recombining oxygen and hydrogen comprising the steps of

a. passing a stream of gas containing free oxygen and hydrogen through a first chamber,

b. initially heating the gas in the first chamber to a temperature above the threshold temperature for thermal recombination to initiate a thermal recombination reaction,

c. transferring the gas from the first chamber into a second chamber and redirecting the gas in a direction countercurrent to the gases coming into the second chamber,

d. exhausting some of the redirected gases from the second chamber,

e. mixing the remainder of redirected gases with the gases being transferred from the first chamber into the second chamber to heat the transferred gases,

f. providing a temperature sensing means in the second chamber for sensing the temperature therein, and

g. substantially maintaining a desired temperature in the second chamber such that substantially all of the recombination reaction takes place in the second chamber, said desired temperature being maintained by controlling the temperature in step (b) in response to the temperature sensed in the second chamber.

3,907,982

CALCINING METHOD FOR ALUMINA

Bruce E. Leach, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 31, 1973, Ser. No. 364,837
Int. Cl. C01f 7/02
U.S. Cl. 423—630 8 Claims

1. In a process for producing a low-density, high-porosity, high-surface area product alumina from an aqueous alumina slurry containing up to about 32 weight percent Al_2O_3 and produced by:

a. hydrolyzing aluminum alkoxides with an effective amount of water to form an organic reaction product and an aqueous alumina slurry; and,

b. thereafter separating the aqueous alumina slurry from the organic reaction product,

wherein said aqueous alumina slurry is contacted with an organic solvent selected from the group consisting of ethanol, propanol, isopropanol, butanol, isobutanol and tertiary butanol in an amount sufficient to produce a product alumina having a loose bulk density from about 7.5 to about 25 lb/ft^3,

a surface area from about 275 to about 400 m^2/g and a pore volume from about 1 to about 2.75 cc/g, to form a solvent-aqueous alumina mixture; said mixture is dried and said dried alumina is calcined and said product alumina is recovered, the improvement comprising calcining said dried alumina at a temperature in excess of 350°F in an atmosphere containing from about 1.0 to about 20.0 volume percent carbon dioxide in mixture with gases selected from the group consisting of air, nitrogen, argon, helium, hydrogen, carbon monoxide, superheated steam, and mixtures of superheated steam and hydrocarbon compounds containing up to about 30 carbon atoms and mixtures thereof and recovering said product alumina, said product alumina being substantially white and extrudable.

3,907,983

PHARMACEUTICAL PREPARATIONS

Pyare Lal Seth, Arlesheim, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 30, 1974, Ser. No. 438,135

Claims priority, application Switzerland, Feb. 16, 1973, 2331/73

Int. Cl.[2] A61J *3/02*

U.S. Cl. 424—35 **10 Claims**

1. A free-flowing water wettable powder which is directly compressible without prior granulation into rapidly absorbed tablets and which is composed of individual rapidly disintegrating particles of a pharmaceutically active substance spray-coated from aqueous solutions with from about 0.5% to about 10% by weight of a hydrophilising material selected from the group consisting of methylcellulose, hydroxyethylmethylcellulose and hydroxypropylmethylcellulose.

3,907,984

HAIR HOLDING COMPOSITIONS CONTAINING A WATER-INSOLUBLE BLOCK COPOLYMER

Anthony J. Calvert, Tilehurst; Eric C. Collingwood, and Richard Johnston, both of Woodley, all of England, assignors to The Gillette Company, Boston, Mass.

Filed Feb. 7, 1974, Ser. No. 440,507

Claims priority, application United Kingdom, Feb. 12, 1973, 06721/73

Int. Cl.[2] A61K *9/11*

U.S. Cl. 424—47 **7 Claims**

1. A hair holding composition, which comprises a solution, in an organic solvent selected from the class consisting of ethanol, isopropanol, and methylene dichloride, of an effective amount of a water-insoluble block copolymer represented by the formula, A—B—$(A\text{-}B)_n$-A; in which segments A are selected from the class consisting of polymers of 2-vinylpyridine, 4-vinylpyridine, 2-methyl-5-vinylpyridine, and acrylamides and methacrylamides of the formula $CH_2{=}CXCONR'R''$, where X is H or CH_3, R′ is H or an n-alkyl group containing from 3 to about 8 carbon atoms, and R″ is an n-alkyl group containing from 3 to about 8 carbon atoms; segments B are selected from the class consisting of polymers of butadiene, isoprene, isobutene, an alkyl acrylate where the alkyl group contains from 2 to 12 carbon atoms, an alkyl methacrylate where the alkyl contains 4 to 12 carbon atoms, a vinyl n-alkyl ether where the alkyl group contains 1 to 4 carbon atoms, an alkyl-substituted butadiene where the alkyl group contains 1 to 4 carbon atoms, and chloroprene; *n* is 0 or an integer from 1 to 5; and the block copolymer contains from about 10 to about 90 percent by weight of segments A and, complementally, from about 90 to about 10 percent of segments B.

7. The hair holding composition as defined in claim **1**, which also includes a propellant.

3,907,985

POLYSTYRENE SULFONATE CONTAINING OPTHALMIC SOLUTIONS

Billy F. Rankin, Rockville, Md., assignor to Burton, Parsons and Company, Inc., Washington, D.C.

Filed July 27, 1973, Ser. No. 383,286

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 **10 Claims**

1. An ophthalmic composition useful for providing lubricating and cushioning effects on traumatized eyes cmprising an aqueous solution of a water soluble styrene sulfonate polymer having a molecular weight of about 75,000 to about 10,000,000 in an amount of from about 0.05 to about 20 weight percent sufficient to provide a viscosity of from about 0 to about 30,000 cps., and from about 100 to about 5000 weight percent based on the styrene sulfonate polymer of a polyalkylene glycol having a molecular weight of from about 400 to about 6000 selected from the group consisting of polyethylene glycol and polypropylene glycol.

3,907,986

LIVE ATTENUATED INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS VACCINES AND PREPARATION THEREOF

Nathan Zygraich, Brussels, and Michele Lobmann, Ceroux-Mousty, both of Belgium, assignors to Recherche et Industrie Therapeutiques, Belgium

Filed Dec. 18, 1972, Ser. No. 316,178

Int. Cl.[2] C12K *7/00*

U.S. Cl. 424—89 **6 Claims**

1. A live virus infectious bovine rhinotracheitis vaccine comprising an effective dose of at least $10^{4.2}$ $TCID_{50}$ of a temperature-sensitive nitrous acid mutant of a pathogenic infectious bovine rhinotracheitis virus capable of causing abortion in pregnant cows, said mutant being able to multiply locally in the upper respiratory tract of a bovine animal without significant virus multiplication in warmer internal organs, and a pharmaceutical diluent.

3,907,987

ENTERIC DISEASE VACCINE

Michael R. Wilson, Guelph, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 25, 1972, Ser. No. 256,977

Int. Cl. A61k *23/00*

U.S. Cl. 424—92 **6 Claims**

1. A bacterial vaccine for the prevention or treatment of *E. coli* infections comprising a live strain or strains of *E. coli* incubated in and modified by dilute solutions of about 0.02 to about 0.08% v/v formalin, to give an altered growth pattern and appearance, and reduced viable cell count.

3,907,988

ANTIBIOTIC COMPLEX A 21101 AND PROCESS FOR PRODUCING SAME

Donald C. Delong; David H. Lively, and Norbert Neuss, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 676,310, Oct. 18, 1967, Pat. No. 3,745,158. This application Dec. 26, 1972, Ser. No. 318,056

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—115 **3 Claims**

1. The antibiotic complex A-21101 produced by cultivating the organism *Arachniotus aureus*, NRRL 3205 in a culture medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic conditions until a substantial amount of A-21101 is produced by said organism in said culture medium, and recovering the A-21101 complex from said culture medium, said complex being characterized as follows: a slightly colored substance which is insoluble in water and aliphatic hydrocarbons and soluble in most other organic solvents; is stable in solution over a pH range of pH

3 to pH 9 at ordinary temperatures; and contains no titratable groups.

3,907,989
NOVEL ANTIBIOTIC NO. 1998 AND PROCESS FOR PRODUCING THE SAME

Yukiji Shimojima; Yukiko Mizuno, both of Tokyo; Sadayuki Horiguchi, Shizuoka; Masayuki Mizuno, Miyazaki; Tadaaki Ohoka, Shizuoka, and Isao Takeda, deceased, late of Osaka, Japan (by Emiko Takeda, legal representative), assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1974, Ser. No. 469,870
Claims priority, application Japan, May 22, 1973, 48-56297
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—118 **3 Claims**

1. An antibiotic No. 1998, or pharmaceutically acceptable salts thereof, whose hydrochloride has a melting point of 142° to 145°C., a molecular weight of 540 (according to vapor pressure osmosis method), elementary analysis values of C 50.1%, H 6.3%, N 7.6%, O 24.1% and Cl 12.78% and the infrared curve illustrated in FIG. **2** hereof.

3,907,990
ANTIBIOTICS ZERVACIN I AND ZERVACIN II AND PROCESS FOR PREPARING THE SAME

Alexander D. Argoudelis, Portage, and LeRoy E. Johnson, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 13, 1973, Ser. No. 424,624
Int. Cl. A61k *21/00*
U.S. Cl. 424—119 **5 Claims**

1. Antibiotic zervacin I, which is active against various Gram-positive bacteria, and in its essentially pure crystalline form

a. has the following elemental analyses: C, 56.49; H, 7.50; N, 13.26; O, 22.75 (by difference);
b. has a melting point of 220.2° C.;
c. has a specific rotation $[\alpha]_D^{25} = +16°$ (c, 1.0, methanol);
d. has the following ultraviolet absorption spectrum In methanol:

λ max (mμ)	a
217 (sh)	22.47
264 (sl.sh)	—
268 (sl.sh)	—
273	2.82
282	3.04
289	2.74
315	0.41

e. is soluble in dimethylformamide, dimethylsulfoxide and lower alcohols; is less soluble in chlorinated hydrocarbon solvents and ethyl acetate; is rather insoluble in acetone and ether;
f. has a characteristic infrared absorption spectrum when suspended in mineral oil mull as shown in FIG. **1** of the drawing;
g. has a characteristic nuclear magnetic resonance spectrum as shown in FIG. **2** of the drawing; and
h. has a characteristic chromatographic pattern as shown in FIG. **5** of the drawing.

2. Antibiotic zervacin II, which is active against various Gram-positive bacteria, and which in its essentially pure crystalline form

a. has the following elemental analyses: C, 56.01; H, 7.60; N, 13.34; O, 23.05 (by difference);
b. has a melting point of 257.1° C.;
c. has a specific rotation $[\alpha]_D^{25} = 4.5°$ (c, 1.0, methanol);
d. has the following ultraviolet absorption spectrum In methanol:

λ max (mμ)	a
216 (sh)	23.10
264 (sl.sh)	2.22
268 (sh)	2.46
274	2.67
281	2.86
289	2.52

e. is soluble in dimethylformamide, dimethylsulfoxide and lower alcohols; is less soluble in chlorinated hydrocarbon solvents and ethyl acetate; is rather insoluble in acetone and ether;
f. has a characteristic infrared absorption spectrum when suspended in mineral oil mull as shown in FIG. **3** of the drawing;
g. has a characteristic nuclear magnetic resonance spectrum as shown in FIG. **4** of the drawing; and
h. has a characteristic chromatographic pattern as shown in FIG. **5** of the drawing.

3,907,991
METHODS OF KILLING CERTAIN BACTERIA AND FUNGI AND DIMINISHING DENTAL PLAQUE

Anthony F. Accetta, 375 Oakford St., West Hempstead, N.Y. 11552

Continuation-in-part of Ser. No. 342,116, March 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 151,638, June 10, 1971, abandoned. This application Feb. 25, 1974, Ser. No. 445,444
Int. Cl.[2] A61K *33/40*
U.S. Cl. 424—130 **5 Claims**

1. A method of killing *Escherichia coli*, *Streptococcus mutans*, *Staphylococcus aureus*, or *Candida albicans* present in inflamed tissues of the mouth, which comprises contacting said bacteria or fungus with an effective, non-toxic amount of a freshly prepared composition consisting of aged solution (A), which comprises the reaction product of 0.5 to 8 ml of a 1 to 20 weight percent aqueous chromic acid solution and 30 ml of a 1 to 20 weight percent aqueous hydrogen peroxide solution, said product exhibiting a pH of about **4**, contains both Cr^{+3} and Cr^{+6} ions, and has been aged at least 24 hours; and solution (B), which consists of a 1 to 20 weight percent aqueous hydrogen peroxide solution in the proportion of between 1:10 and 10:1 of solution (A) to solution (B).

3,907,992
PHARMACEUTICAL COMPOSITIONS CONTAINING SALTS OF SULFOGLYCOPEPTIDES WITH AMINOACIDS

Adriano Butti, Como, and Giuseppe Prino, Milan, both of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Villa Guardia, Italy

Filed Oct. 10, 1973, Ser. No. 405,178
Claims priority, application Italy, Oct. 18, 1972, 30582/72
Int. Cl.[2] A61K *27/00*
U.S. Cl. 424—177 **12 Claims**

1. A pharmaceutical composition for the treatment of gastro-duodenal diseases, comprising

as active agent an anti-inflammatory effective non-toxic amount of a sulfoglycopeptide salt whose anion is that of the sulfoglycopeptide salt disclosed in the U.S. Pat. No. 3,518,243 and whose cation is a nitrogen-containing organic cation derived from an alpha-amino acid,

and a pharmaceutical diluent.

3,907,993

METHOD FOR SYSTEMICALLY CONTROLLING PLANT DISEASE EMPLOYING CERTAIN PYRIDAZINES

Fred Y. Edamura, Concord, and Ronald J. Sbragia, Clayton, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 14, 1974, Ser. No. 451,664
Int. Cl.[2] A01N 9/22
U.S. Cl. 424—250 10 Claims

1. A method for systematically controlling diseases of plant-life forms caused by soil-borne plant disease organisms selected from the group consisting of Verticillium, Rhizoctonia, Phytophthora, Pythium and Thielaviopsis which comprises applying an effective amount of from 0.1 to about 10 pounds per acre of a plant protectant selected from the group consisting of 6-(1-piperidinyl)tetrazolo(1,5-b)pyridazine, 6-(4-methyl-1-piperidinyl)tetrazolo(1,5-b)pyridazine and 6-(2-methyl-1-piperidinyl)tetrazolo(1,5-b)pyridazine to plant life forms or their environment to thereby permit assimilation thereof by said plant life form to systemically control the plant disease.

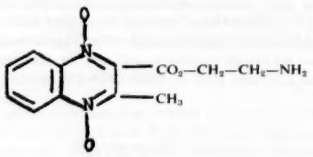
3,907,994

SUBSTITUTED ALKYL ESTERS QUINOXALINE-DI-N-OXIDE-2-CARBOXYLIC ACID AS GROWTH PROMOTING AGENTS

Timothy H. Cronin, East Lyme, and Kenneth Richardson, Groton, both of Conn., assignors to Pfizer, Inc., New York, N.Y.

Division of Ser. No. 135,792, April 20, 1971, Pat. No. 3,818,007, which is a continuation-in-part of Ser. No. 20,841, March 18, 1970, abandoned. This application Sept. 13, 1973, Ser. No. 397,163
Int. Cl.[2] A61K 31/495
U.S. Cl. 424—250 1 Claim

1. A method for promoting growth and improving feed efficiency in swine which comprises orally or parenterally administering to said swine a dosage amount of from about 0.1 mg/kg to about 100 mg/kg of body weight per day over a major portion of the swine's active growth period, a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof.

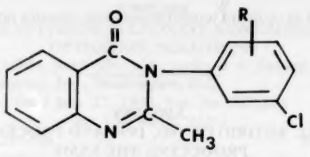
3,907,995

MITICIDAL COMPOSITION

Kunihiro Yabutani, Kadoma, and Zitsuichi Kishikawa, Takatsuki, both of Japan, assignors to Nihon Nohyaku Co. Ltd., Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 391,125
Claims priority, application Japan, Sept. 1, 1972, 47-87116; Sept. 13, 1972, 47-92004
Int. Cl.[2] A01N 9/00, 9/22
U.S. Cl. 424—251 5 Claims

1. A method of killing mites and their eggs, which comprises applying to the mites miticidally effective amount of a compound having the general formula:



in which R represents methyl or ethyl.

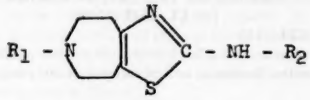
3,907,996

PHARMACEUTICAL COMPOSITION CONTAINING A 2-MINO-4,5,7,8-TETRAHYDRO-6H-THIAZOLO OR -OXAZOLO 5,4-D AZEPINE AND METHOD OF USE

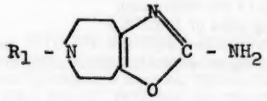
Gerhart Griss; Manfred Kleeman; Wolfgang Grell, and Helmut Ballhause, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

Division of Ser. No. 169,065, Aug. 4, 1971, Pat. No. 3,804,849. This application Jan. 23, 1974, Ser. No. 435,719
Claims priority, application Germany, Aug. 14, 1970, 2040510; June 2, 1971, 2127267
Int. Cl.[2] C07D 498/04, 513/04
U.S. Cl. 424—270 12 Claims

1. A pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective hypotensive, sedative, antitussive or antiphlogistic amount of a compound of the formula



or



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, hydroxy-alkyl of 1 to 4 carbon atoms, allyl, cyclohexyl, hexahydrobenzyl, phenyl, phenethyl, benzyl, mono- or di-halobenzyl, mono-, di- or trimethoxybenzyl, trifluoromethyl-benzyl or (alkyl of 1 to 3 carbon atoms)-benzyl, and

R_2 is hydrogen, alkyl of 1 to 5 carbon atoms, allyl, cyclohexyl, phenyl, benzyl or phenethyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

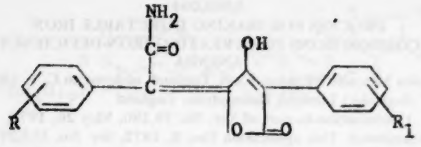
3,907,997

ANTI-ARTHRITIC COMPOSITIONS COMPRISING AMIDE DERIVATIVES OF PULVINIC ACID AND METHODS OF PRODUCING ANTI-ARTHRITIC ACTIVITY

Blaine M. Sutton, Hatboro, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 26, 1971, Ser. No. 192,588
Int. Cl.[2] A61K 31/335
U.S. Cl. 424—279 9 Claims

1. A pharmaceutical composition having anti-arthritic activity, in dosage unit form, comprising a pharmaceutical carrier and from about 10 mg. to about 50 mg. of an amide derivative of pulvinic acid of the formula:



in which:
R and R_1 are each hydrogen, chlorine, bromine, fluorine or lower alkyl.

3,907,998

METHODS FOR RELIEVING BRONCHIAL SPASM WITH 9,15-DIOXYGENATED PROSTANOIC AND PROST-13-ENOIC ACIDS AND THE LIKE

Jehan F. Bagli, Valois Gardens, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Quebec, Canada

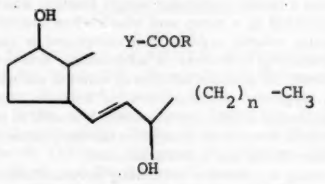
Continuation of Ser. No. 259,896, June 5, 1972, Pat. No. 3,773,795, which is a continuation-in-part of Ser. No. 157,704, June 28, 1971, abandoned. This application July 5, 1973, Ser. No. 377,973

Int. Cl.[2] A61K *31/20, 31/215*

U.S. Cl. 424—318 **6 Claims**

1. A method of alleviating bronchospasms which comprises administering to a host in need of such alleviation an effective amount to alleviate bronchospasm of a composition comprising:

a. a compound of the formula



in which R is hydrogen or lower alkyl, *n* is an integer from 1 to 6 and Y is CH_2—(a)—$(CH_2)_m$ wherein (a) is CH_2CH_2, CH=CH or C≡C and *m* is an integer from 2 to 4; and

b. a pharmacologically-acceptable carrier.

3,907,999

SUBSTITUTED DIBENZOCYCLOOCTENE COMPOSITIONS

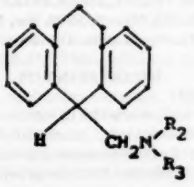
Marcia E. Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 701,541, Jan. 30, 1968, abandoned. This application Nov. 7, 1972, Ser. No. 304,581

Int. Cl.[2] A61K *31/135*

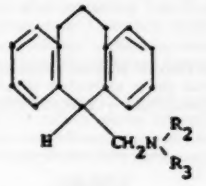
U.S. Cl. 424—330 **10 Claims**

1. A pharmaceutical composition comprising an antiarrhythmia effective amount of a compound of the formula



in which R_2 and R_3 are hydrogen or lower alkyl substitutents having from 1–5 carbon atoms or a derivative of the compound of the above structural formula wherein one or more of the hydrogens attached to the 1, 2, 3, 4, 8, 9, 10 or 11 positions is replaced by halogen, alkyl, trifluoromethyl, alkylsulfonyl, alkylmercapto or dialkylsulfamoyl in combination with a non-toxic pharmaceutically acceptable diluent.

2. A method for treating or preventing arrhythmia in animals which comprises administering to an afflicted animal an effective and non-toxic dose of an active compound having the formula



in which R_2 and R_3 are hydrogen or lower alkyl substituents having from 1–5 carbon atoms or a derivative of the compound of the above structural formula wherein one or more of the hydrogens attached to the 1, 2, 3, 4, 8, 9, 10 or 11 positions is replaced by halogen, alkyl, trifluoromethyl, alkylsulfonyl, alkylmercapto or dialkylsulfamoyl.

3,908,000

PROPYNYL BENZYL ETHERS AS INSECTICIDAL AGENTS

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

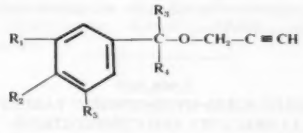
Division of Ser. No. 235,037, March 15, 1972, Pat. No. 3,840,604. This application Dec. 26, 1973, Ser. No. 427,765

Claims priority, application Switzerland, Mar. 19, 1971, 4121/71

Int. Cl.[2] A01N *9/02, 9/08, 9/24, 9/36*

U.S. Cl. 424—341 **5 Claims**

1. An insecticide composition comprising from 0.01 to 0.05 of a propynyl benzyl ether of the formula:



wherein R_1 is hydrogen; R_2 is propynyloxy; R_3 and R_4 are hydrogen or lower alkyl; and R_5 is hydrogen;
and an inert carrier material.

3,908,001

MANUFACTURE OF CHLORINE HYDRATE

Philip C. Symons, and Harry K. Bjorkman, both of Birmingham, Mich., assignors to Energy Development Associates, Madison Heights, Mich.

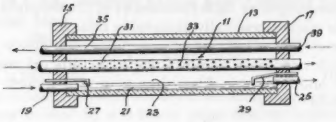
Filed Nov. 18, 1971, Ser. No. 200,047

Int. Cl.[2] C01B *7/02*

U.S. Cl. 423—472 **6 Claims**

1. A method for forming chlorine hydrate which comprises vaporizing aqueous zinc chloride solution having a concentration greater than 10 percent zinc chloride with 0.1 to 4 volumes of chlorine dissolved and/or dispersed therein to form a gaseous form of water and chlorine and contacting said mixture of gases with a heat transfer means at a temperature between about −50° to about +9°C to convert the gas mixture

to chlorine hydrate in solid form, the molar ratio of water and chlorine in gaseous form contacting the heat tranfer means being from about 0.01 to about 8:1 and further providing that



the aqueous zinc chloride solution containing disolved and/or dispersed chlorine gas is electrolyte from a zinc, chlorine, aqueous zinc chloride battery during the charging phase of the battery.

3,908,002

PRODUCTION OF ALPHA ALUMINA

Howard V. Holler, Oakland, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed May 30, 1972, Ser. No. 257,523

Int. Cl.[2] C01F *7/30, 7/02*

U.S. Cl. 423—628 **4 Claims**

1. The process of producing alpha alumina of surface area at least about 40 m^2/g which comprises:

a. thermally decarboxylating a porous aluminum salt of polymerized unsaturated hydrocarbon carboxylic acid in vacuo at a temperature of from about 400°C to about 600°, said porous aluminum salt consisting of an aluminum-ion-linked salt of a polymerized monocarboxylic alkenoic acid of from about 500 to about 2,000,000 average molecular weight and containing from 3 to 6 carbon atoms per monomeric unit selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, maleic acid, sorbic acid and ethacrylic acid,

b. heating the resulting decarboxylation product in an inert dry atmosphere to a temperature above about 1000°C, thereby converting the decarboxylation product to alpha alumina of said surface area and finally

c. removing residual carbon from the alpha alumina product by conversion of the carbon to a gaseous carbon compound by heating said product in an oxygen containing atmosphere at a temperature not substantially greater than about 900°C.

3,908,003

ENROBED SOLID HYDROPHOBIC TABLETING LUBRICANTS AND COMPOSITIONS

Marvin Hersh, Strafford, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 159,569, July 2, 1971, abandoned. This application Mar. 7, 1974, Ser. No. 449,171

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—32 **6 Claims**

1. A tableting lubricant composition consisting essentially of micropellets of finely divided particles of solid hydrophobic tableting lubricant selected from the group consisting of magnesium stearate, calcium stearate, stearic acid, talcum, and powdered vegetable stearine, a substantial proportion of the particles of said lubricant being enrobed in a hydrophilic friable sheath, said sheathing material being selected from the group consisting of mannitol, polyethylene glycol 4,000, 6,000, and 20,000, gelatin, methyl cellulose, carboxymethylcellulose, gum arabic, and polyvinyl alcohol; said enrobed tableting lubricant imparting a reduction in dissolution time to a compacted pharmaceutical dosage form when incorporated in said compacted pharmaceutical dosage form, as compared to said lubricant when not enrobed.

3,908,004

PROCESS FOR MAKING INJECTABLE IRON COMPOSITIONS FOR TREATING IRON-DEFICIENCY ANEMIA

John Metcalfe Kitching, Fleet, England, assignor to C. L. (Basingstoke) Limited, Basingstoke, England

Continuation-in-part of Ser. No. 39,180, May 20, 1970, abandoned. This application Dec. 8, 1972, Ser. No. 313,277

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 **9 Claims**

1. A method of making a composition for administration by injection in the treatment of iron-deficiency anaemia comprising the steps of:

a. forming a mixture of polymers of different molecular weight by polymerising a monosaccharide or an oligosaccharide by heating it in the presence of an acid catalyst until the reducing value (determined with Fehling's solution) of the polymers produced is from about 5–10 percent of that of pure glucose,

b. heating the mixture of polymers with aqueous alkali to form low molecular weight degradation products,

c. separating the resultant mixture of polymers from step (b) into several separate fractions by:

adding to the mixture obtained in step (b) a first increment of a water miscible organic solvent, said solvent being capable of separating said mixture by precipitating said polymers in stages, said first increment being added in an amount sufficient to separate a first high molecular weight fraction which comprises about 5% of the polymers,

removing said high molecular weight fraction and adding to said mixture a second increment of said organic solvent in an amount sufficient to separate the mixture into a middle molecular weight fraction which is precipitated as a syrup and which when reacted with a water soluble organic iron compound is capable of producing a mixture of substantially non-toxic complexes the aqueous solution of which is not too viscous to preclude administration by injection, and a low molecular weight fraction which is soluble in the supernatant, forms iron complexes having undesirably toxic side effects, and is discarded, and

d. reacting the fraction containing polysaccharides of the desired middle molecular weight range with a water soluble iron compound in the presence of alkali to produce a mixture of substantially non-toxic complexes the aqueous solution of which is not too viscous to preclude administration by injection.

3,908,005

PESTICIDAL BENZISOXAZOLO (THIONO) PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Walter Lorenz, Wuppertal-Cronenberg; Horst Boshagen, Haan, Rhineland; Ingeborg Hammann; Wolfgang Behrenz, both of Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

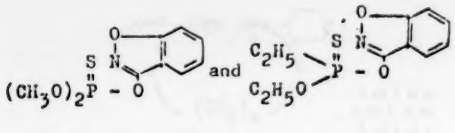
Division of Ser. No. 151,515, June 9, 1973, Pat. No. 3,828,063. This application Mar. 8, 1974, Ser. No. 449,581

Claims priority, application Germany, June 26, 1970, 2031750

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—200 **6 Claims**

1. An insecticidal, acaricidal or nematocidal composition comprising an insecticidally, acaricidally or nematocidally effective amount of a benzisoxazolo(thiono)phosphoric(phosphonic) acid ester selected from the group consisting of



and a diluent therefore.

3,908,006

CERTAIN OXIMINO PHOSPHORUS CONTAINING COMPOUNDS, USED AS INSECTICIDES AND ACARICIDES

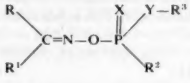
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 26,103, April 6, 1970. This application June 12, 1972, Ser. No. 261,860

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—211 **8 Claims**

1. A method for controlling insects comprising applying thereto an insecticidal amount of a compound having the formula



in which X is sulfur, Y is oxygen, R is alkyl having one to four carbon atoms, R^1 is methyl, R^2 is alkyl having one to two carbon atoms, and R^3 is 2,4,5-trichlorophenyl.

3,908,007

TREATMENT OF MENTAL DEPRESSION

Turan M. Itil, Nyack, N.Y.; Werner Martin Herrmann, Berlin, Germany; Reinhard Horowski, Berlin, Germany; Wolfgang Kehr, Berlin, Germany; Dieter Palenschat, Berlin, Germany; Gerd Paschelke, Berlin, Germany, and Helmut Wachtel, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Sept. 6, 1974, Ser. No. 503,732

Claims priority, application Germany, Sept. 6, 1973, 2345376

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—242 **11 Claims**

1. A method for the treatment of mental depression in an affected person which comprises administering systemically to the affected person an amount of mesterolone or a 17-ester thereof with a hydrocarboncarboxylic acid of 1–8 carbon atoms effective to evoke at least one of a psychostimulating and an antidepressant effect.

3,908,008

COMBATING BACTERIA WITH 2-METHYL-3-CARBOXYLIC ACID AMIDO-QUINOXALINE-1,4-DI-N-OXIDES

Kurt Ley, Odenthal-Gloebusch; Ulrich Eholzer, Cologne-Stammheim; Roland Nast, Cologne-Buchheim; Karl Georg Metzger, Wuppertal-Elberfeld, and Dieter Fritsche, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

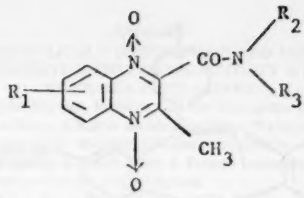
Continuation-in-part of Ser. No. 14,875, Feb. 19, 1970, abandoned, which is a division of Ser. No. 764,611, Oct. 2, 1968, Pat. No. 3,660,391. This application Aug. 24, 1972, Ser. No. 283,442

Claims priority, application Germany, Oct. 4, 1967, 53665

Int. Cl. A61k *27/00*

U.S. Cl. 424—248 **40 Claims**

1. An antibacterial composition which comprises an antibacterially effective amount of a compound of the formula



wherein:

R_1 is hydrogen, lower alkyl, lower alkoxy or chlorine,

R_2 is hydrogen, alkyl containing 1 to 12 carbon atoms, or alkyl containing 1 to 12 carbon atoms substituted by hydroxy, lower alkoxy, carbalkoxy, monoalkylamino or dialkylamino containing from 1 to 4 carbon atoms in each alkyl moiety, and

R_3 is alkyl containing 1 to 12 carbon atoms, or alkyl containing 1 to 12 carbon atoms substituted by hydroxy, lower alkoxy, carbalkoxy, monoalkylamino or dialkylamino containing from 1 to 4 carbon atoms in each alkyl moiety, or

R_2 and R_3 together with the amido nitrogen atom are morpholino or piperazino,

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,908,009

INHIBITING DISCOLORATION OF AQUEOUS COMPOSITIONS CONTAINING HEXAMETHYLENETETRAMINE 1,3-DICHLOROPROPENE SALTS

Sotiros C. Polemenakos, Framingham, and Horst G. Langer, Wayland, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 29, 1974, Ser. No. 465,038

Int. Cl.[2] A01N *9/22;* **A61K** *31/53;* **A61L** *13/00*

U.S. Cl. 424—249 **2 Claims**

1. An aqueous solution consisting essentially of about 0.05 to about 0.5 weight percent, solution basis, of cis-1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride and, as a color-stabilizing agent for the said chloride to prevent yellowing, a substantially equal weight of an amine of the group morpholine, ethylamine, N-methylethanolamine, diethanolamine, dipropylamine, di-isopropanolamine and di-sec.-butanolamine.

3,908,010

BASICALLY SUBSTITUTED HETEROCYCLES AS ANTIMETICS

Jean Schmutz, Muri, and Fritz Hunziker, Bern, both of Switzerland, assignors to Dr. A. Wander, Bern, Switzerland

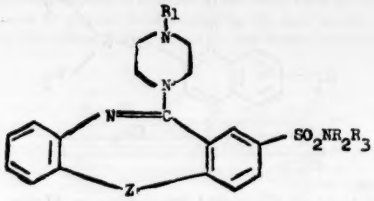
Continuation of Ser. No. 57,317, July 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 769,373, Oct. 21, 1968, Pat. No. 3,539,573, which is a continuation of Ser. No. 712,956, March 14, 1968, abandoned. This application Jan. 22, 1974, Ser. No. 435,430

Claims priority, application Switzerland, Mar. 22, 1967, 4103/67; May 9, 1967, 6557/67; July 14, 1967, 10115/67; Nov. 3, 1967, 15453/67

Int. Cl. H61k *27/00*

U.S. Cl. 424—250 **4 Claims**

1. A method for treating emesis, which comprises enterally or parenterally administering to a mammal in need of said treatment an anti-emetic effective amount of a compound of the formula:



and pharmaceutically acceptable acid additional salts thereof, where Z denotes sulphur, R_1 represents hydrogen, allyl, alkyl containing not more than 3 carbon atoms, hydroxyalkyl containing not more than 3 carbon atoms, alkoxyalkyl containing not more than 6 carbon atoms or alkoyloxyalkyl containing not more than 6 carbon atoms and R_2 and R_3 are the same or different and represent hydrogen or methyl.

3,908,011

TRIALKOXY SUBSTITUTED-4-AMINO-QUINAZOLINES AND NITRATES THEREOF IN THE TREATMENT OF PAIN DUE TO ANGINA PECTORIS

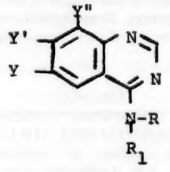
Lloyd P. Gabel, Dover, and William R. Simpson, Mendham, both of N.J., assignors to Sandoz Inc., East Hanover, N.J.

Division of Ser. No. 180,762, Sept. 15, 1971, Pat. No. 3,833,587, which is a division of Ser. No. 89,472, Nov. 13, 1970, Pat. No. 3,637,700, which is a continuation-in-part of Ser. No. 870,439, Dec. 5, 1969, abandoned. This application June 10, 1974, Ser. No. 477,609

Int. Cl.[2] A61K *31/495*, *31/505*

U.S. Cl. 424—250 **4 Claims**

1. The method of relieving pain due to angina pectoris comprising administering to a mammal an anti-anginal effective amount of a compound of the formula:



wherein R is from the group of

a. $-CH_2(-CH_2)_n-ONO_2$

b. $-CH_2(-\underset{\displaystyle R^o}{CH})_n-ONO_2$, and

c. $-CH_2(-CH_2)_z-N[-CH_2(CH_2)_y-ONO_2]_2$

R_1 is from the group of

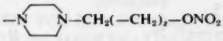
d. $-CH_2(CH_2)_n-ONO_2$ when R is a. as above defined,

e. hydrogen, and

f. alkyl of 1 to 4 carbon atoms,

R^o is hydrogen, $-(CH_2-)_mCH_3$ or $-(CH_2-)_nONO_2$, provided that one R^o is other than hydrogen, that the sum of n and m does not exceed 6 and that the sum of n and y does not exceed 7, or

R and R_1 together with the 4- amino nitrogen attached to the quinazoline ring form



n is 1 to 6

m is 0 to 4

y is 1 to 4

z is 1 to 4, and

each of Y, Y′ and Y″ is alkoxy of 1 to 3 carbon atoms, or a pharmaceutically acceptable non-toxic acid addition salt thereof.

3,908,012

ARYLPYRIMIDINES-INHIBITORS OF PLATELET AGGREGATION AND BRONCHODILATORS

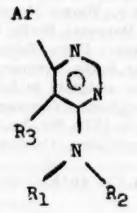
Gerald George De Angelis, Wilton, and Hans-Jurgen Ernst Hess, Old Lyme, both of Conn., assignors to Pfizer, Inc., New York, N.Y.

Division of Ser. No. 182,220, Sept. 20, 1971, Pat. No. 3,859,288, which is a continuation-in-part of Ser. No. 78,216, Oct. 5, 1970, abandoned. This application June 19, 1973, Ser. No. 371,420

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **15 Claims**

1. A method of inhibiting platelet aggregation in the blood of humans which comprises administering to said humans an effective amount sufficient to inhibit platelet aggregation in the blood of the humans of a compound selected from the group consisting of those of the formula:

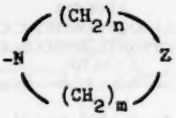


and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar is selected from the group consisting of phenyl; substituted phenyl wherein said substituent is methyl, methoxy, 3,4-dimethoxy, hydroxy, trifluoromethyl, fluorine, chlorine, bromine, carboxy, cyano, nitro, dialkylamino said alkyl containing from 1 to 3 carbon atoms, amino or acylamino containing from 1 to 4 carbon atoms; pyridyl; thienyl; furyl; monosubstituted pyridyl, thienyl or furyl wherein said substituent is acylamino containing from 1 to 4 carbon atoms; naphthyl; 3-indolyl; 2- and 3-benzofuryl; and 2- and 3-benzothienyl;

R_1 and R_2 when considered separately are each selected from the group consisting of hydrogen; alkyl containing from 1 to 4 carbon atoms; substituted ethyl wherein said substituent is selected from the group consisting of 2-dimethylamino, 2-hydroxy and 2,2,2-trifluoro; alkenyl containing from 3 to 4 carbon atoms; pyridylmethyl; 2-monosubstituted phenyl wherein said substituent is carboxy or sulfamoyl; and cycloalkyl containing from 3 to 7 carbon atoms;

R_1 and R_2 when taken together with the nitrogen atom to which they are attached form a heterocyclic ring of the formula:



wherein Z is selected from the group consisting of CH_2, O, S and N-alkyl containing from 1 to 3 carbon atoms; *n* and *m* are integers of from 2 to 3; and

R_3 is selected from the group consisting of hydrogen and alkyl containing from 1 to 3 carbon atoms.

3,908,013

PHARMACEUTICAL AROMATIC GUANIDINE COMPOSITIONS AND METHODS OF USING SAME

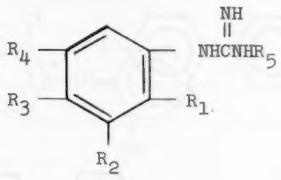
John Lawrence Hughes, and Robert Chung-Huan Liu, both of Kankakee, Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Division of Ser. No. 73,244, Sept. 17, 1970, abandoned. This application Apr. 15, 1974, Ser. No. 460,815

Int. Cl.[2] A61K *31/47, 31/44, 31/155, 31/18*

U.S. Cl. 424—258 **10 Claims**

1. A pharmaceutical composition having vasoconstrictive activity consisting of a pharmaceutical grade carrier and a vasoconstricting amount of (an) a non-toxic aromatic guanidine compound having the formula:



wherein: R_1 is hydrogen, alkyl having one to four carbon atoms, or alkoxy having one to four carbon atoms; R_2 is hydroxy, hydroxymethyl, alkyl having one to four carbon atoms, alkoxy having one to four carbon atoms, acetyl or methanesulfonamido; or R_1 and R_2 are joined in a tetramethylene group or a pyrido group; or (R) R_2 is hydrogen when R_1 is a moiety other than hydrogen; R_3 is hydrogen, hydroxy, chloro, bromo, fluoro, alkyl having one to four carbon atoms, or alkoxy having one to four carbon atoms except that when R_2 is hydroxy, R_3 is also hydroxy and if R is chloro, bromo or fluoro, R_1 will not be hydrogen; R_4 is hydrogen, chloro, bromo, fluoro, alkyl having one to four carbon atoms, or alkoxy having one to four carbon atoms; and R_5 is hydrogen or methyl; or a non-toxic acid addition salt thereof.

9. The method of treating an animal host including man which host requires vasoconstriction comprising administering to said host an effective vasoconstricting amount of the composition according to claim **1.**

3,908,014

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING HISTAMINE ACTIVITY WITH THIOUREA DERIVATIVES

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote; Charon Robin Ganellin, Welwyn Garden City, and George Raymond White, Harpenden, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

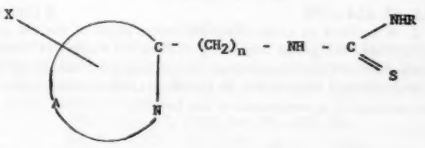
Division of Ser. No. 312,438, Dec. 6, 1972, Pat. No. 3,808,336, which is a continuation-in-part of Ser. No. 145,024, May 19, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,774

Claims priority, application United Kingdom, June 25, 1970, 30834/70; Oct. 15, 1970, 49007/70; Jan. 22, 1971, 2918/71

Int. Cl.[2] A61K *31/44, 31/41, 31/425, 31/415*

U.S. Cl. 424—263 **10 Claims**

1. A pharmaceutical composition to inhibit H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, comprising a pharmaceutical carrier and, in an effective amount to inhibit said H-2 histamine receptors, a thiourea compound of the formula:



in which:

A is such that with the carbon and nitrogen atoms shown it forms a thiazolyl, 1,2,4-triazolyl or pyridyl ring;

n is from 3 to 6;

R is hydrogen, lower alkyl, benzoyl, phenylethyl or 2-(hydroxyphenyl)ethyl; and

X is hydrogen, halogen or lower alkylthio or a pharmaceutically acceptable acid addition salt thereof.

3,908,015

CERTAIN MONOUNSATURATED ESTERS USED TO CONTROL INSECTS

Daniel Hainaut, Villemomble, and Jean-Pierre Demoute, Montreuil-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

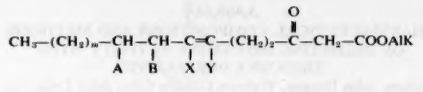
Filed July 3, 1974, Ser. No. 485,386

Claims priority, application France, July 13, 1973, 73.25760

Int. Cl.[2] A01N *9/24, 9/28*

U.S. Cl. 424—278 **5 Claims**

1. A method of killing insects comprising contacting insects with an insecticidally effective amount of at least one compound of the formula



wherein A is selected from the group consisting of chlorine and bromine, B is hydroxy or A and B together form the epoxide, X and Y are hydrogen or indicate another bond between the carbon atoms to which they are attached, AlK is alkyl of 1 to 8 carbon atoms and *m* is 3, 4 or 5 with the proviso that X and Y are hydrogen when A and B form the epoxide.

3,908,016

SYNTHETIC HORMONES FOR INSECT CONTROL

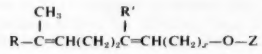
William S. Bowers, Geneva, N.Y., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 363,295, May 23, 1973, Pat. No. 3,852,472, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application Aug. 22, 1974, Ser. No. 499,690

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—278 **6 Claims**

1. A method of controlling the maturation of insects selected from the group consisting of *Tenebrio molitor* (L.) and *Epilachna varivestis* comprising contacting said insects at an immature stage of growth with an effective maturation inhibiting amount of a compound of the formula

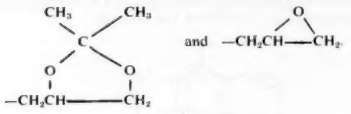


wherein

R and R′ are straight chain alkyls containing from 1 to 2 carbon atoms;

x is a number from 1 to 2; and

Z is selected from the group consisting of



3,908,017

SYMPATHOMIMETIC COMPOSITIONS CONTAINING AN ESTER OF -3-HYDROXY-α-[(METHYLAMINO)METHYL[BENZYL ALCOHOL AND METHODS OF USE

Anwar A. Hussain, and James E. Truelove, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 354,540, April 26, 1973, Pat. No. 3,825,583. This application May 9, 1974, Ser. No. 468,477

Int. Cl.[2] A61K *31/22*

U.S. Cl. 424—311 **13 Claims**

1. A sympathomimetic composition comprising a sympathomimetically effective amount of a member selected from the group consisting of 3-pivaloxy-α-[(methylamino)methyl]-benzyl alcohol and its non-toxic pharmaceutically acceptable acid addition salt, admixed with a non-toxic organic or inorganic pharmaceutically acceptable carrier.

3,908,018

THERAPEUTICAL AND COSMETIC COMPOSITION INCLUDING N-PROPIONYL-EPSILON-AMINO-CAPROIC ACID

Jean Choay, Neuilly-sur-Seine, France, assignor to Choay S.A., Paris, France

Division of Ser. No. 264,753, June 21, 1972, Pat. No. 3,857,950, which is a continuation-in-part of Ser. No. 820,298, April 29, 1969, abandoned. This application July 26, 1974, Ser. No. 493,237

Claims priority, application France, May 3, 1968, 68.150414; Aug. 2, 1968, 68.161612

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 **5 Claims**

1. An orally or topically administrable pharmaceutical composition for the treatment of a mammal suffering from a cutaneous lesion or wound or burn or from a bone fracture containing as the active ingredient an effective amount of N-propionyl-epsilon-aminocaproic acid or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

3,908,019

GERMICIDAL AND FUNGICIDAL AGENT AND USE THEREOF

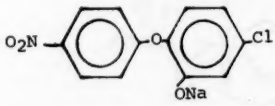
Teruhisa Noguchi; Yoshinobu Hashimoto, both of Fujisawa; Yoshio Uchiyama, Takaoka, and Michio Ueyama, Tokyo, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

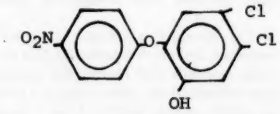
Division of Ser. No. 92,151, Nov. 23, 1970, Pat. No. 3,772,445. This application Mar. 23, 1973, Ser. No. 344,091The portion of the term of this patent subsequent to Nov. 30, 1990, has been disclaimed.

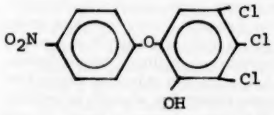
Int. Cl.[2] A01N *9/24*

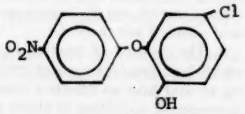
U.S. Cl. 424—340 **6 Claims**

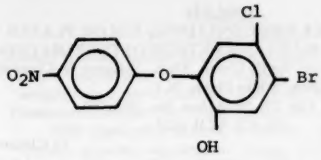
1. A method for preventing the propagation of fungi or bacteria which comprises contacting the fungi or bacteria with an effective fungicidal or bactericidal amount of a diphenyl ether selected from the group consisting of:

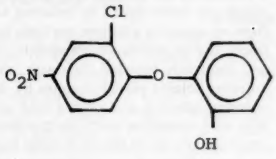


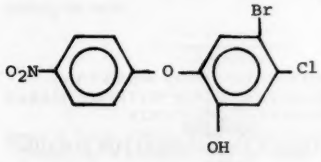


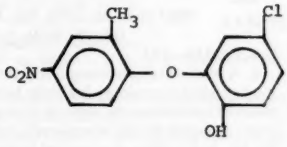


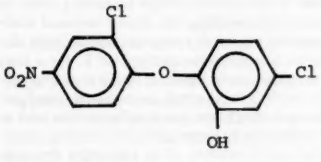


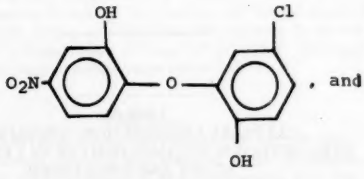












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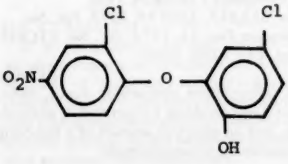


3,908,020

COMPLETE FEED PRODUCT FOR PREVENTION OF MILK FEVER IN DAIRY COWS

Larry A. Schroeder, Glen Ellyn, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Sept. 23, 1974, Ser. No. 508,222
Int. Cl.[2] A23K *1/22, 1/18*
U.S. Cl. 426—2 8 Claims

1. A calcium-limiting, complete feed product for dairy cows comprising from about 40% to 70% by weight of a grain source selected from the group consisting of cracked corn, ground corn, milo, barley and mixtures thereof, from about 0.5% to 10% by weight of a protein source selected from the group consisting of urea, bean seed meal and mixtures thereof, and from about 20% to 35% by weight of a roughage selected from the group consisting of oat hulls, rice hulls, cottonseed hulls, peanut hulls, wheat straw, low calcium grass hays and mixtures thereof, said feed composition having a calcium content of less than about 0.2% by weight.

3,908,021

PREPARING A NEUTRAL TASTING ALCOHOLIC BASE

Arthur J. Rehberger, Milwaukee, and Lydia J. Marinelli, West Allis, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Aug. 17, 1973, Ser. No. 389,385
Int. Cl.[2] C12C *1/00, 9/00, 11/00, 11/04*
U.S. Cl. 426—16 7 Claims

1. A method of preparing a neutral tasting alcoholic base, comprising the steps of mixing a low soluble protein, low-kiln malt with water at a temperature in the range of 66°C to 77°C to provide a mash, said malt having a moisture content in the range of 5% to 6% by weight, a diastase value in the range of 150 to 240, and a soluble protein content based on total protein in the range of 30% to 37% by weight, maintaining the mash at said temperature for a period of time sufficient to provide a wort, boiling the wort for a period of 10 to 40 minutes, mixing the boiled wort with an adjunct containing from 40% to 95% by weight of fermentable carbohydrate to provide a fermentable extract, said adjunct being present on a solids basis in the amount of 70% to 95% by weight of the combined weight of said wort and said adjunct, adding brewer's yeast to said extract, adding to the extract prior to fermentation a water-soluble, food-compatible nitrogen-containing compound in an amount sufficient to provide a nitrogen content of 50 to 500 ppm in the extract, fermenting the extract to provide a fermented substrate, and thereafter removing the yeast from the substrate to provide a neutral-tasting alcoholic substrate.

3,908,022

NON-SATURABLE BUN

George L. Selleck, 16-B Division St., Glens Falls, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,764
Int. Cl.[2] A21B *5/02*; A21D *13/00, 8/06*
U.S. Cl. 426—27 6 Claims

1. A method of making an edible bun having a channel formed in a top surface thereof which channel is particularly adapted for holding solid food and/or a liquid food substance, comprising the steps of:

placing a predetermined quantity of dough between the two mating parts of a two-part baking utensil one of which parts defines a recess to form the lower exterior bun portion and the other of which defines a thin-walled protuberance extending at least partly within the recess to form the bun channel,

baking the dough by applying more heat to the side of the assembled utensil which comprises said other part than to the side which comprises said one part while concurrently maintaining the dough in close contact with said other part,

and discontinuing the baking when the surface of the bun channel which is heated through said thin-walled protuberance has a hard surface crust which is substantially impermeable to liquids while the bottom bun surface has only a relatively thinner crust to provide a soft dinner-roll finish and the bun interior is of a soft, smooth bread texture.

3,908,023

IMPARTING CINNAMON-LIKE FLAVOR WITH CERTAIN 3-PHENYL PENTENAL ACETALS

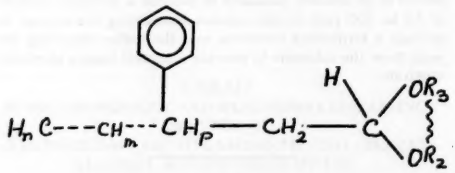
William Lewis Schreiber, Jackson; Manfred Vock, Locust; John B. Hall, Rumson, all of N.J.; Edward Joseph Shuster, N.Y., and Alton Dewitt Quinn, Abrahamsville, Pa., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 276,922, Aug. 1, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,951

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—536 **4 Claims**

1. A process for altering the organoleptic properties of a foodstuff which comprises adding to said foodstuff in the absence of intense hydrolytic conditions a small but effective amount to impart to said foodstuff a cinnamon-like aroma and taste of a 3-phenyl pentenal acetal having the structure:



wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond; wherein R_2 and R_3 each represents methyl or ethyl; or R_2 and R_3 taken together represents ethylene; wherein when the dashed line at the "4,5" position is a double bond n is 2, m is 1 and p is 1; wherein when the dashed line at the "3,4" position is a double bond n is 3, m is 1 and p is 0.

3,908,024

DRY BEVERAGE MIX CONTAINING COLOR PLATED SUCROSE PARTICLES AND METHOD OF PREPARATION

Bartley N. Wankier, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed July 27, 1973, Ser. No. 383,352

Int. Cl. A23l *1/27*

U.S. Cl. 426—72 **10 Claims**

1. A dry beverage mix containing sucrose wherein at least a portion of the sucrose is in the form of crystalline particles which are color plated by coloring solutes deposited thereon from an aqueous solution, said mix having a minor amount of finely divided tricalcium phosphate (TCP) particles intimately and discretely blended therewith, said TCP particles having coloring solutes plated thereon by deposition of an aqueous coloring solution and drying said solution prior to blending with said crystalline particles portions of the coloring solutes originally plated on the TCP being transferred to and adhering on the surfaces of the colored crystalline sucrose particles.

3,908,025

PET FOOD PRODUCT AND METHOD FOR FORMING SAME

Timothy A. Miller, Ferguson, Mo., and Carlo J. Hansen, Waterloo, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Sept. 21, 1972, Ser. No. 290,794

Int. Cl.[2] A23L *1/18*

U.S. Cl. 426—623 **15 Claims**

1. A method of producing a soft crumb textured expanded food product containing fat from farinaceous-proteinaceous material comprising the steps of mixing farinaceous-proteinaceous material having nutritionally balanced properties, edible fat, and lecithin at a level of between about 1 and 8 percent by weight with the farinaceous-proteinaceous materials and fat; adjusting the moisture content of the mixture to between about 20 and 35 percent by weight by adding water to the mixture; mechanically working the mixed material while simultaneously applying elevated pressures thereto and also heating it to elevated temperatures above 212° F. for a time period sufficient to convert said material into a flowable substance; and then extruding the heated, pressurized, mechanically worked material through restricted orifice means into an environment of a substantially lower pressure, causing expansion of the material and formation of an expanded structure therein having a soft crumb texture.

3,908,026

CULINARY COMPOSITION CONTAINING PARAMETHOXYCINNAMALDEHYDE AS A FLAVORING AGENT AND SWEETENER

James S. Neely, Liberty Twp., Butler County, and James A. Thompson, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 352,813, April 19, 1973, Pat. No. 3,867,557. This application Dec. 11, 1974, Ser. No. 531,641

Int. Cl.[2] A21D *10/00*

U.S. Cl. 426—538 **2 Claims**

1. A culinary mix composition comprising sugar, flour, shortening, from about 0.001 to about 1.0 percent of paramethoxycinnamaldehyde, and an effective amount of a flavoring agent other than paramethoxycinnamaldehyde.

3,908,027

JELLY-LIKE FOODS

Hiroshi Kimura, Kyoto; Kensuke Kusakabe, Osaka; Shigehiko Sato, Tokyo, and Hiromi Nakatani, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 200,577, Nov. 19, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 448,048

Claims priority, application Japan, Nov. 21, 1970, 45-103090

Int. Cl.[2] A23L *1/04*

U.S. Cl. 426—578 4 Claims

1. A method for producing jelly-like foods with an elastic gel skin and with a pasty or liquid core, which comprises; maintaining a 1.5 to 6 percent (weight/volume) suspension of a thermally gelable polysaccharide which mainly consists of β-1,3-pyranoglucose units, in a mold having a volume that could be accommodated in the space of a cube 5 to 30 millimeters on edge; externally heating the mold at a temperature in the range of 60° to 120°C for about 5 to 300 seconds; and cooling the mold.

3,908,028

SOFT DRINK COMPOSITION CONTAINING PARAMETHOXYCINNAMALDEHYDE AS A FLAVORING AGENT AND SWEETNER

James S. Neely, Liberty Twp., Butler County, and James A. Thompson, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 352,813, April 19, 1973, Pat. No. 3,867,557. This application Dec. 11, 1974, Ser. No. 531,496

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—538 4 Claims

1. A soft drink composition comprising:

A. from about 0.001 to about 0.10% of paramethoxycinnamaldehyde;

B. from about 0 to about 0.09% of a flavoring agent other than paramethoxycinnamaldehyde;

C. from about 0 to about 0.09% of a sweetening agent other than paramethoxycinnamaldehyde; and

D. balance, carbonated water.

3,908,029

METHOD FOR DRYING PASTA PRODUCTS WITH MICROWAVE HEATING

Clyde Fredrickson, Danville, Calif., assignor to Microdry Corporation, San Ramon, Calif.

Filed June 29, 1972, Ser. No. 267,452

Int. Cl.[2] A21D *6/00*

U.S. Cl. 426—242 8 Claims

1. A method of preparing pasta products comprising subjecting moist pasta to treatment with microwave energy to heat the same to a temperature in excess of 175° F. and to remove moisture therefrom, and cooling said heated pasta in an atmosphere having a relative humidity of from 75 to 100 percent and a temperature of from 70° to 120° F. until said pasta has an internal temperature below 160° F.

3,908,030

SLIME CONTROL COMPOSITIONS AND THEIR USE

Bernard F. Shema, Glenside, and Robert H. Brink, Jr., Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 27, 1973, Ser. No. 391,723

Int. Cl.[2] A01N *9/00, 9/12, 9/20, 9/26*

U.S. Cl. 424—270 8 Claims

1. A composition for the control of the microorganism *Aerobacter aerogenes* in aqueous systems comprising a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one calcium chloride and 25% 2-methyl-4-isothiazolin-3-one calcium chloride with pentachlorophenol, wherein the weight ratio of the chloride mixture to the pentachlorophenol ranges from about 95:5 to about 5:95 respectively.

3,908,031

ETHANOL VAPOR STERILIZATION OF NATURAL SPICES AND OTHER FOODS

Hugo E. Wistreich; George J. Thundiyil, and Hyunil Juhn, all of Chicago, Ill., assignors to B. Heller and Co., Chicago, Ill.

Filed Mar. 12, 1973, Ser. No. 340,220

Int. Cl.[2] A23L *3/34*

U.S. Cl. 426—335 11 Claims

1. A method for sterilizing foods and food products selected from the group consisting of natural spices, hydrogenated fats, grain and grain flours and dehydrated or partially dehydrated fruits comprising the steps of contacting the material with ethanol in the vapor phase maintained at a temperature within the range of 78° to 150°C for a time sufficient to reduce the bacteria load of the product, and separating the sterilized product from the vapor.

3,908,032

PROCESS FOR THE CONTINUOUS MANUFACTURE OF SOFT CANDIES

Pierre Didelot; Guy Lasserre, both of Paris; Georges Letourneau, Lagny, and Jean Marie Sudan, Asnieres, all of France, assignors to General Foods France, Montreuil-sous-Bois, France

Filed Dec. 19, 1973, Ser. No. 426,152

Claims priority, application France, Dec. 20, 1972, 72.45492

Int. Cl.[2] A23G *3/30;* A23L *1/09*

U.S. Cl. 426—660 5 Claims

1. A continuous process for making soft candy comprising:

a. preparing an aqueous solution of sugar, glucose, fat and binder;

b. rapidly concentrating the solution to a free-flowing pasty consistency under conditions minimizing the formation of invert sugar;

c. rapidly cooling the free-flowing paste of (b) to a temperature of about 70°C;

d. mixing and stretching the cooled paste to induce formation of crystallization nuclei throughout the paste and to provide a homogeneous soft texture, said mixing and stretching effected at a temperature of about 70°C in a blender having parallel axis stirrers in opposed rotation within a tank;

e. homogenizing the paste under pressure;

f. extruding the homogenized paste at a temperature of at least 70°C, in the form of a web onto a cooling belt;

g. cooling the extruded paste web to a temperature substantially intermediate between the temperature after extrusion and ambient temperature;

h. further homogenizing the cooled paste web and extruding the homogenized paste web in the form of one or more rods on to a cooling belt; and

i. cooling the extruded rods of homogenized paste to ambient temperature.

3,908,033

PREPARATION OF SOLUBLE COFFEE

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Scientific and International Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 273,258, July 19, 1972, Pat. No. 3,809,775. This application Jan. 2, 1973, Ser. No. 320,595

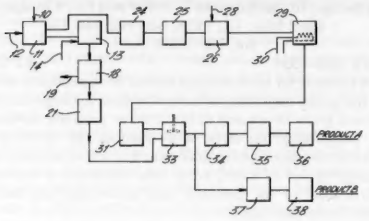
Claims priority, application United Kingdom, Jan. 5, 1972, 361/72. The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.

Int. Cl. A23f *1/10, 1/04*

U.S. Cl. 426—427 10 Claims

1. A method of producing soluble coffee extract which comprises extraction and separation of caffeine from green coffee beans by a solvent, separating the solvent from the caffeine, roasting the decaffeinated coffee beans, extracting the roasted coffee with water under heat and pressure, holding the liquid extract of coffee for 1 to 10 hours at below 40°F to

precipitate benzopyrenes and benzofluoranthanes, centrifuging or filtering the liquid extract to remove the precipitate, feeding the liquid coffee extract from the centrifuge to a



mixing tank, feeding the caffeine to said mixing tank, mixing said caffeine with said liquid coffee extract in said mixing tank and thereafter drying the liquid extract.

3,908,034

CONTINUOUS PUFFING METHOD

George W. Paugh, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 188,383, Oct. 12, 1971, Pat. No. 3,764,343. This application July 20, 1973, Ser. No. 381,124

Int. Cl.[2] A23L *1/18*

U.S. Cl. 426—449 **3 Claims**

1. A method of continuously puffing a food product comprising sequentially passing a plurality of conveying members through a puffer barrel, establishing a fluid pressure seal between each of said conveying members and said puffer barrel to form continuously moving chambers between adjacent conveying members and the puffer barrel, metering a food product into the continuously moving chambers, supplying steam to said chambers at a pressure and for a period of time sufficient to permit the puffing of the food product upon the release of the pressure and terminating said chamber to release the pressure therein and permit the food product to be puffed.

3,908,035

METHOD OF ROASTING MEAT

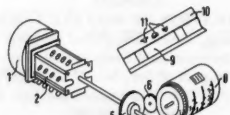
Dieter Schweig, and Sabine Schmiedel, both of Traunreut, Germany, assignors to Siemens Elektrogerate GmbH, Berlin, Germany

Continuation-in-part of Ser. No. 142,685, May 12, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,287

Claims priority, application Germany, May 13, 1970, 2023242

Int. Cl.[2] A23L *1/31*

U.S. Cl. 426—523 **4 Claims**



1. Method of roasting meat in a cooking chamber which comprises cooking the meat at different temperatures, independently of the weight and type of meat and independently of whether the meat is frozen, fresh or defrosted, during two successive time intervals the total of which constitutes a constant minimum preparation time interval having a preselected duration of from 2½ to 5 hours, the meat being precooked during the first of the time intervals at a given temperature within the range of 230°C to 270°C, and then finish-cooked during the second of the time intervals at a given temperature within the range of 75°C to 90°C, the precooking time interval being predetermined in accordance with the weight, type of meat and whether the meat is frozen, fresh or defrosted, the finish-cooking time interval being the difference between the total preselected constant minimum preparation time interval and the precooking time interval.

3,908,036

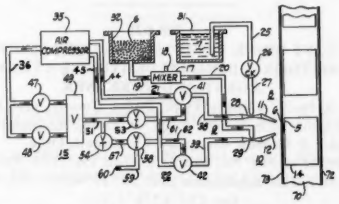
METHOD OF REMOVABLY MARKING A CONTAINER

Joseph P. Milleson, Fort Atkinson, Wis., assignor to Crepaco, Inc., Lake Mills, Wis.

Division of Ser. No. 333,621, Feb. 20, 1973. This application Feb. 13, 1974, Ser. No. 442,113

Int. Cl.[2] B05B *5/02*

U.S. Cl. 427—10 **8 Claims**



1. The method of temporarily marking a surface associated with a container with a plurality of dielectric particles each particle having a portion of the surface thereof covered with a light reflecting coating, comprising the steps of:

applying a liquid to the surface to prepare the surface for attraction with the dielectric particles;

establishing an attractive force between the dielectric particles and the prepared surface;

depositing the particles at the prepared surface to be held thereat by the attractive force;

shining an incident light beam on the deposited particles from one side of a plane being substantially perpendicular to the surface at the point of incidence;

detecting a reflected light beam from the light reflecting coating of the deposited particles on the same side of the plane as the incident beam for conveying information thereby;

and removing the particles to allow remarking of the surface.

3,908,037

IMAGE DEVELOPING TECHNIQUES

John T. Bickmore, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 180,426, Sept. 14, 1971, Pat. No. 3,818,864. This application Mar. 18, 1974, Ser. No. 452,152

Int. Cl.[2] G03G *13/08*

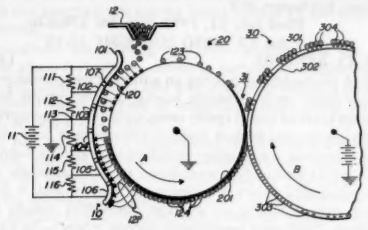
U.S. Cl. 427—14 **9 Claims**

1. A method for removing and applying charged toner particles from and to, respectively, a surface; said method comprising the steps of

maintaining said surface in spaced apart relationship with respect to an electrode means;

establishing a uniformly varying electrostatic field between said electrode means and said surface, said field being selected to define a first region having electrostatic forces which tend to urge toner particles toward said electrode means, a second region having electrostatic forces which tend to urge toner particles toward said surface, and a transistion between said first and second regions;

translating said surface relative to said electrode means so that points on said surface sequentially advance through said first and second regions; and



projecting developer containing toner into the space between said electrode means and said surface proximate said first region to dislodge any residual toner particles adhering to said surface and to supply toner particles for application to said surface.

3,908,038
THERMOPLASTIC MOLDING COMPOSITIONS

Louis F. Nienart, Elizabeth; Ralph R. Saunders, Dover, and Paul Jeges, Carteret, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 345,634, March 28, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,517

Int. Cl.[2] **C08K** *3/20, 3/36;* **C10M** *7/28*

U.S. Cl. 427—27 **9 Claims**

1. A thermoplastic composition comprising:

a. a polyamide;

b. polytetrafluoroethylene in the form of discrete particles having an average diameter size ranging from about 5 to 30 microns, said polyamide and polytetrafluoroethylene being present in weight proportion of about 60 to 40 percent of polyamide and correspondingly about 40 to 60 percent of polytetrafluoroethylene; and

c. about 2 to 11 percent by weight of the composition of an inert filler selected from the group consisting of silica and magnesium oxide in the form of discrete particles having an average diameter size ranging from about 0.01 to 15 microns.

3,908,039
PHOTOCURABLE POLYENE-POLYTHIOL LACQUER COMPOSITION

James L. Guthrie, Ashton, and Francis J. Rendulic, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 409,615, Oct. 25, 1973, which is a continuation-in-part of Ser. No. 209,369, Dec. 17, 1971, Pat. No. 3,787,303. This application Jan. 14, 1975, Ser. No. 541,030

Int. Cl.[2] **B05C** *5/00;* **C08F** *8/00;* **C08K** *5/49;* **C08F** *5/34*

U.S. Cl. 427—54 **2 Claims**

1. A photocurable lacquer composition comprising (A) a polythiol component containing at least 2 -SH groups per molecule; (B) as a polyene component, the diadduct of diallyl malate and toluene diisocyanate; the mole ratio of ene to thiol being from about 0.2:1 to about 5:1; (C) from about 0.0005 to about 50 percent by weight of the composition of a photocuring rate accelerator component; (D) from about 1 to about 50 parts by weight per 100 parts by weight of the polyene-polythiol combination of a normally liquid plasticizer component selected from the group consisting of polyethylene glycol having molecular weight of up to about 400, dioctyl phosphate and dibutyl phthalate.

3,908,040
METHOD OF ENCAPSULATION

Richard J. Dauksys, Bellbrook, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 7, 1974, Ser. No. 431,198

Int. Cl.[2] **C09D** *3/58;* **H01B** *3/40*

U.S. Cl. 427—58 **6 Claims**

1. A method of encapsulating structurally delicate electrical, optical and mechanical components which comprises covering portions of the components with a composition with a low coefficient of thermal expansion consisting essentially of a pourable, homogeneous mixture of an epoxy resin, discontinuous fibers having a length in the range of 1 to 10 mils, the fibers being selected from the group consisting of graphite fibers, boron nitride fibers and mixtures thereof, the amount of discontinuous fibers being in the range of 10 to 16 parts by weight per 100 parts by weight of epoxy resin, and a curing agent for the epoxy resin; and curing the composition so as to form a solid epoxy resin covering the portions of the components.

3,908,041
PROCESS OF MANUFACTURING AN ELECTRICAL RESISTIVE ELEMENT

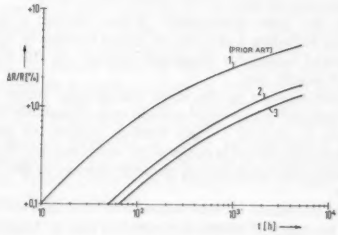
Alfred Engl; Kurt Marth, and Peter Stoever, all of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 15, 1973, Ser. No. 415,958

Claims priority, application Germany, Nov. 20, 1972, 2256770

Int. Cl.[2] **C09C** *1/44*

U.S. Cl. 427—101 **9 Claims**



1. A process of manufacturing an electrical resistive element comprised of a conductive film composed of elemental carbon deposited by thermal decomposition of a hydrocarbon gas on a substrate, said substrate composed of an inorganic dielectric silicon-dioxide containing ceramic, the process comprising:

cleansing select surfaces of said substrate, and subjecting the cleansed surfaces to the action of a reaction gas containing a pyrolytically decomposable fluoro-carbon compound having the general formula:

$$C_nF_x$$

wherein n is a whole integer and x is equal to $2n$ or $2n+2$, under pressure-temperature conditions conducive to a reaction between decomposition products of said fluoro-carbon compound and said silicon-dioxide ceramic so as to etch said cleansed surfaces and immediately thereafter deposit elemental carbon on said etched surfaces without exposing said surfaces to any oxidizing medium between the etching and the carbon deposition steps.

3,908,042

PROCESS FOR THE IMPREGNATION OF FIBER STRANDS AND TAPES

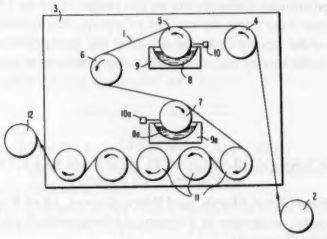
Herbert Heissler; Norbert Raab, and Horst Wurtinger, all of Munich, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg A.G., Munich, Germany

Filed Jan. 17, 1972, Ser. No. 218,115

Claims priority, application Germany, Jan. 15, 1971, 2101756

Int. Cl.[2] B05D *1/28*, *1/40*

U.S. Cl. 427—172 13 Claims



1. A process for the impregnation of carbon strands having substantial length, which process comprises

winding carbon fiber strands off of a pivotal take-off means at a low take-off tension by controlling the take-off force to minimize damage to the carbon fiber strand,

impregnating all sides of the strand with a resin,

passing the resin impregnated strand through a guiding means including a plurality of rollers to achieve a predetermined adjustable maximum tension on the impregnated strand, and

thereafter winding up the resin impregnated strand under said adjustable maximum tension onto a rotatable support means to provide a high winding tension, so that the carbon fiber strand is constructed uniformly and homogeneously impregnated with minimal damage of the carbon fiber,

wherein the strand is cross-wound onto said take-off means and the take-off means is pivoted so that its longitudinal axis is at an angle approximately equal to the wind-up angle of the cross-wound strand on said take-off means whereby damage to the reinforcing fibers of said strand is avoided.

12. A process for the impregnation of carbon strands having substantial length, which process comprises

winding carbon fiber strands off of a pivotal take-off means at a low take-off tension by controlling the take-off force to minimize damage to the carbon fiber strand,

impregnating all sides of the strand with a resin,

passing the resin impregnated strand through a guiding means including a plurality of rollers to achieve a predetermined adjustable maximum tension on the impregnated strand, and

thereafter winding up the resin impregnated strand under said adjustable maximum tension onto a rotatable suport means to provide a high winding tension, so that the carbon fiber strand is constructed uniformly and homogeneously impregnated with minimal damage of the carbon fiber,

wherein the low take-off tension in said carbon strand is controlled to be in the range of about 50 to about 250 ponds.

3,908,043

METHOD FOR MAKING SEAMLESS FLOORING AND THE LIKE

Robert M. Evans, University Heights, and Joseph S. Fogel, Cleveland Hts., both of Ohio, assignors to Isonetics Corporation, Rochester, N.Y.

Filed July 11, 1972, Ser. No. 270,620

Int. Cl.[2] B05D *1/36*; E04F *15/10*

U.S. Cl. 427—203 14 Claims

1. A method for providing an adherent wear-resistant, decorative layer on a substrate having a substantially hardened sealant layer of liquid epoxy resin, said method comprising (1) applying on said sealant layer a polyurethane base chip coat, said chip coat comprising a solution in organic solvent of (A) an —NCO terminated prepolymer of a diisocyanate containing unequally reactive isocyanate groups and a branched chain polyol having an average equivalent weight of from 1000 to 2000, said prepolymer having a free —NCO content of from 1.5 to 6%, and as a cross linking agent (B) a solid resin having at least 4 hdyroxyl groups per molecule, (2) incorporating colored paint chips into the surface regions of said chip coat after its application over said sealant coat on said sealant layer, but before it is permitted to hardern, (3) permitting said chip coat with chips therein to solidify, (4) applying over the solidified chip coat an intermediate coating of a solution of polyurethane comprising: (a) an —NCO terminated prepolymer of a diisocyanate containing unequally reactive isocyanate groups and a branched chain polyol having an average equivalent weight of from 180 to 400, wherein said prepolymer has a free —NCO content of from 1.5 to 6% and (b) a solid, soluble hydroxyl containing resin having at least 4 hydroxyl groups per molecule to react with said —NCO groups of said prepolymer, (5) after permitting said intermediate coat to harden applying over the hardened surface a glaze coat which comprises a solution of: (i) an —NCO terminated prepolymer of a diisocyanate containing unequally reactive isocyanate groups and a branch chain polyol having an equivalent weight of between 160 and 400 and a free —NCO content of 5 to 10% and (ii) a chain extender comprising a polycaprolactone troil, a polyester having an equivalent weight of about 200 to 600 and about 3 hydroxyls per molecule or mixtures thereof, to react with said free —NCO.

3,908,044

APPARATUS AND METHOD FOR COATING A WEB

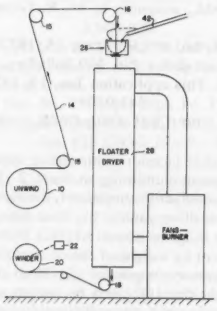
John R. Gunning, Oakville, Canada, assignor to Abitibi Paper Company Ltd., Toronto, Canada

Continuation of Ser. No. 187,785, Oct. 8, 1971, abandoned. This application Nov. 15, 1973, Ser. No. 416,105

Claims priority, application Canada, Oct. 13, 1971, 95355

Int. Cl.[2] B05C *9/04*, *3/02*, *3/12*

U.S. Cl. 427—209 14 Claims



1. A method of coating a flexible web comprising the following steps:

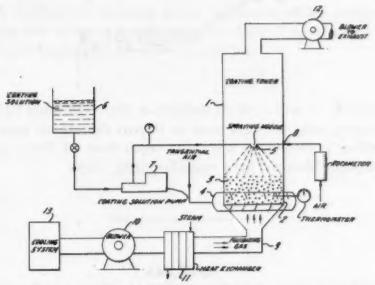
a. passing the web through reservoir means containing a liquid coating material for wetting the web surface by the coating material;
b. subsequent to step (a), passing the web through a die opening defined by spaced die walls in communication with the reservoir means for being wetted by the coating material;
c. throughout the coating operation, maintaining the die walls along their entire extent in perfect parallelism with respect to one another and with a spacing having a predetermined value ranging in magnitude from about 0.003 inch to about 0.020 inch;
d. as a part of step (b), maintaining the web at a predetermined, parallel-spaced relationship throughout substantially the entire extent of the die walls for effecting coating by shearing the coating material in contact with the web surface in a direction parallel thereto, while avoiding wedging of the coating material between the die walls and the web; and
e. subsequent to steps (b) and (d), passing the coated web through a drying zone.

3,908,045

ENCAPSULATION PROCESS FOR PARTICLES

David S. Alterman, Parsippany, and Kil Whan Chun, Ridgefield Park, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 7, 1973, Ser. No. 422,813
Int. Cl.[2] B05D *1/02, 1/36*
U.S. Cl. 427—213 **8 Claims**



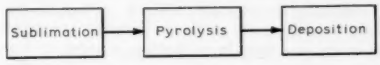
1. A process for coating particles of an oxidizing material having at least one reactive chlorine atom in its molecular structure comprising the steps of:
i. placing said particles in such a configuration as to define a layer thereof having a thickness between about ½ inch and about 6 inches, on a perforated support,
ii. adjusting the height of a downwardly disposed spraying means capable of producing a spray of liquid droplets in a downwardly diverging pattern, to a level such that the outermost droplets of said spray contact said layer of particles at the perimeter thereof as defined by said layer in static state,
iii. causing a gas to flow upward through said perforated support, thereby expanding the thickness of said layer and maintaining said particles in continuous motion to form a fluidized bed,
iv. spraying a solution of a solidifiable fatty acid on said fluidized bed until all particles in said bed are completely coated with said fatty acid, and
v. treating said fatty-acid coated particles with an aqueous solution of a fixed alkali hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide, and calcium hydroxide, and mixtures thereof, said treatment comprising
a. agitating said fatty acid-coated particles in said aqueous hydroxide solution for about 10 to about 120 minutes at a temperature of about 85°F to about 130°F, and not higher than about 5°F below the melting point of said fatty acid,
thereby reacting said hydroxide with at least a portion of said fatty acid, the concentration of said fixed alkali in said solution being about 3 to about 10 percent when said alkali is sodium hydroxide, about 10 to about 15 percent when said fixed alkali is potassium hydroxide, and about 0.1 percent when said fixed alkali is calcium hydroxide, by weight of said solution.

3,908,046

P-XYLENE VAPOR PHASE POLYMERIZATION COATING OF ELECTROSTATOGRAPHIC PARTICLES

John W. Fitzpatrick, Fairport; Rudolph Forgensi, Webster; Robert G. Johnston, Rochester, and H. Ronald Thomas, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1974, Ser. No. 445,376
Int. Cl.[2] C23C *13/02*
U.S. Cl. 427—216 **9 Claims**



1. A process for coating electrostatographic carrier particles having an average diameter of between about 1 micron and about 1,000 microns with a p-xylylene polymeric material comprising the steps of:
a. subliming a cyclic di-p-xylylene dimer to form a dimer vapor,
b. pyrolyzing said dimer vapor in a vacuum of between about 0.0001 and 10.0 millimeters of mercury to form vaporous p-xylylene diradicals,
c. agitating a bed of said carrier particles within a high frequency vibrating chamber, and
d. contacting said vaporous p-xylylene diradicals with said agitated bed of carrier particles at a temperature above about 30°C by drawing said vacuum through said agitated bed of carrier particles thereby forcing said vaporous diradicals to travel a circuitous path directly through said agitated bed of carrier particles whereby sufficient contact is effected between said carrier particles and said vaporous diradicals to allow polymerization of said diradicals on said carrier particles at temperatures above the ceiling condensation temperature of said vaporous p-xylylene diradicals.

3,908,047

PROCESS FOR COATING AN ALUMINA BASE

Harold Beuther; Thaddeus P. Kobylinski, both of Gibsonia, and Roger F. Vogel, Butler, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 5, 1973, Ser. No. 421,829
Int. Cl.[2] B05D *1/32*
U.S. Cl. 427—282 **8 Claims**

1. A process for coating an alumina having a surface area of about 1.0 to about 500 square meters per gram, a layer thickness of about 1.0 to about 1600 microns and a pore diameter of about 10 to about 300 A disposed as a coating on a highly impervious and substantially inert monolith having a low surface area which comprises impregnating a first portion of said alumina coating with a paraffin wax by immersing said monolith in a molten paraffin wax bath having a temperature of about 40° to about 150°C for about 1 to about 60 minutes, cooling the impregnated monolith to solidify the paraffin wax, impregnating a second portion of said alumina coating by immersion in an aqueous or alkanoic solution of a first noble metal salt maintained at a temperature of about 10° to about 45°C for about 1 to about 60 minutes, wherein the alkanol has from one to five carbon atoms, subsequently calcining the

treated monolith in air at a temperature of about 400° to about 800°C for about 1 to about 20 hours to remove the paraffin wax on said first portion of the alumina coating and to deposit theron a first noble metal on said second portion of said alumina coating, impregnating said second portion of said alumina coating with a paraffin wax by immersing said monolith in a molten paraffin wax bath having a temperature of about 40° to about 150°C for about one to about 60 minutes, cooling the impregnated monolith to solidify the paraffin wax impregnating said first portion of said alumina coating by immersion in an aqueous or alkanoic solution of a second metal salt maintained at a temperature of about 10° to about 45°C for about 1 to about 60 minutes, wherein the alkanol has from one to five carbon atoms and subsequently calcining the impregnated monolith in air at a temperature of about 400° to about 800°C for about one to about 20 hours to remove the paraffin wax on said second portion of said alumina coating and to deposit a second noble metal on said first portion of said alumina coating.

3,908,048

METHOD OF IMPROVING INTERFIBER COHESION OF FILAMENT YARNS

Hideo Kawanaka, Osaka; Kenichi Katabe, Wakayama; Seizi Kameda, Wakayama, and Go Takemoto, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1973, Ser. No. 348,768

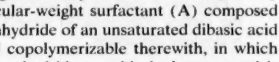
Claims priority, application Japan, Apr. 7, 1972, 47-34947

Int. Cl.[2] C08J *7/04*

U.S. Cl. 427—377 **5 Claims**

1. A method of improving the interfiber cohesion of filament yarns, which consists essentially of applying 0.5 to 3% by weight of a fiber-treating agent to a filament yarn, said fiber-treating agent consisting essentially of from 10 to 50 parts by weight of a high-molecular-weight surfactant (A) composed of a copolymer of an anhydride of an unsaturated dibasic acid with a vinyl compound copolymerizable therewith, in which the molar ratio of said anhydride to said vinyl compound is from 5/1 to 1/5, in which the degree of polymerization is from 2 to 50 based on said anhydride, in which from 5 to 95% of the acid groups are amidated by an aliphatic amine containing at least one alkyl group having 1 to 22 carbon atoms and the remaining acid groups are converted to salts of an alkali metal, a lower amine, an alkanol amine or ammonia, and (b) from 90 to 50 parts by weight of at least one member selected from the group consisting of:

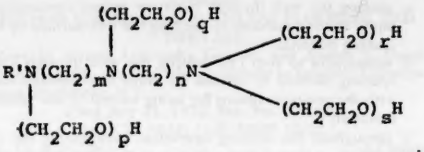
1. compounds having the formula



(1)

wherein R is an alkyl or alkenyl group having 8 to 18 carbon atoms or a residue of a condensate of 1 mole of a higher alcohol having 8 to 18 carbon atoms with 1 to 10 moles of ethylene oxide, X is hydrogen, metal, a residue of polyethylene glycol wherein the mole number of ethylene oxide is 1 to 5, ammonium or organic group-substituted ammonium, and m and n are integers of 1 to 2 with the proviso that the sum of m and n is 3,

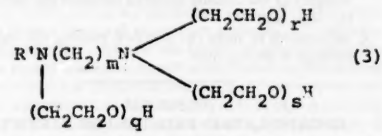
2. compounds having the formula



(2)

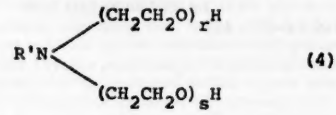
wherein R′ is alkyl, alkenyl or acyl group having 8 to 18 carbon atoms, p, q, r and s are integers of 0 to 5 with the proviso that the sum of p, q, r and s is 1 or more, and m and n are integers of 1 to 3,

3. compounds having the formula



(3)

wherein R′, m, q, r and s are as defined in above formula (2), and (4) compounds having the formula



(4)

wherein R′, r and s are as defined in above formula (2), and then aging said filament yarn to impart thereto an improved interfiber cohesion to minimize separation of fibers during subsequent filament yarn manufacturing steps.

3,908,049

METHOD FOR COATING METAL SURFACES WITH AQUEOUS DISPERSIONS OF CARBOXYL CONTAINING POLYMERS

Chester W. Fitko, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 259,637, June 5, 1972, abandoned. This application May 14, 1973, Ser. No. 359,955

Int. Cl.[2] B05D *3/02;* **B32B** *15/08*

U.S. Cl. 427—386 **12 Claims**

1. A method of coating metal surfaces which comprises applying to the metal surface an aqueous dispersion having dispersed therein a coating mixture comprised of (1) about 80 to about 97 percent by weight of a carboxyl containing polymer having at least 8 percent by weight carboxyl groups, a major portion of the carboxyl groups being neutralized with an alkaline compound to effect dispersion thereof, the polymer being comprised of an α,β-ethylenically unsaturated carboxyl acid having 3 to 8 carbon atoms, and a monomer selected from the group consisting of the alkyl esters of acrylic and methacrylic acids, (2) about 1 to about 10 percent by weight of a water dispersible, heat curable thermosetting resin selected from the group consisting of an aminoplast resin and a polyepoxide resin and (3) about [2]1 to 12 percent by weight of a water insoluble, long chain monohydroxyl alcohol having 8 to 36 carbon atoms and then heating the aqueous dispersion to a temperature between about 350° to about 450°F to volatilize the water and alcohol and cure and harden the coating mixture.

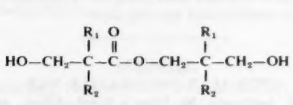
3,908,050

METAL COATING COMPOSITIONS PREPARED FROM AQUEOUS DISPERSIONS OF CARBOXYL CONTAINING POLYESTER RESINS

Vishnu P. J. Gor, Country Club Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed June 19, 1974, Ser. No. 480,903
Int. Cl.[2] C08L 61/28
U.S. Cl. 427—388 6 Claims

1. An aqueous coating dispersion composition comprised of a vehicle dispersed in water, the vehicle being comprised of
   a. about 70 to 95 percent by weight of a carboxyl containing polyester resin and
   b. about 5 to 30 percent by weight of an aminoplast resin, the carboxyl containing polyester being the reaction product of
      i. an esterdiol having the general formula



wherein R_1 and R_2 are alkyl groups having 1–4 carbon atoms and

   ii. a stoichiometric excess of a mixture of polycarboxylic acids comprised of about 97.5 to about 99.9 percent by weight of at least one aromatic polycarboxylic acid or anhydride having 2 to 3 carboxylic acid groups and 0.1 to 2.5 percent by weight of an aliphatic dicarboxylic acid having 4 to 10 carbon atoms.

5. A method for coating metal substrates which comprises applying the coating composition of claim 1 to a metal substrate and heating to harden the coating.

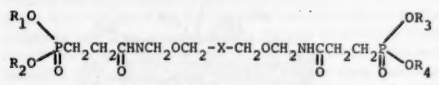
3,908,051

METHOD FOR PROCESSING CELLULOSE CONTAINING MATERIALS TO IMPART THERETO FLAME RESISTANCE

Kosuke Yamamoto, Kamakura, Japan, assignor to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,802
Claims priority, application Japan, Feb. 28, 1973, 48-23266
Int. Cl.[2] C09D 5/18
U.S. Cl. 427—396 4 Claims

1. A method for flameproofing cellulosic materials comprising applying to the cellulosic material an aqueous solution of a phosphorus compound represented by the following general formula:



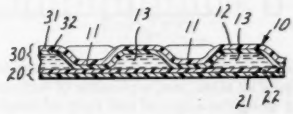
wherein R_1 to R_4 are the same or different alkyl, alkenyl or alkoxyalkyl groups which may be substituted by one or more chlorine or bromine atoms and X is a residue of a urea derivative capable of forming, when reacted with formaldehyde, a dimethylol compound, and drying said flameproofed cellulosic materials

3,908,052

LIQUID CRYSTAL DISPLAY DEVICE AND METHOD OF MAKING

David A. Sanders, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 6, 1974, Ser. No. 448,550
Int. Cl.[2] B32B 1/06
U.S. Cl. 428—1 13 Claims



1. As a new article of manufacture, a laminated product adapted for providing colored visual displays of unusual brilliance, comprising in combination:
   a substrate,
   a transparent covering layer comprising thin, pre-formed self-supporting flexible transparent polymeric film bonded to said structure along narrow lines which intersect to define a multiplicity of small contiguous closed cells, and
   a thin layer of liquid crystal material within and completely filling said cells.

13. A method of making the article of claim 1 comprising the steps of:
   a. providing a pair of thin, heat-sealable flexible sheet materials of substantially uniform thickness,
   b. juxtaposing said sheet materials with their heat-sealable surfaces in opposed relationship,
   c. interposing between said opposed surfaces a liquid crystal composition,
   d. providing a pair of squeeze rolls
      1. the first of said pair of squeeze rolls being provided with a cover of compressible rubber-like material,
      2. the second of said pair of squeeze rolls being provided with means for heating and having a circumferentially outer portion of incompressible heat-conductive material, the peripheral surface of said portion being defined by narrow intersecting ridges which encloses spaces therebetween,
   e. heating the peripheral surface of said second squeeze roll to a temperature at least equal to that at which the heat sealable surfaces bond under pressure,
   f. applying pressure to said rolls,
   g. passing between said squeeze rolls the juxtaposed sheet materials and interposed liquid crystal composition, and
   h. controlling the rate of passage, the temperature and pressure to effect sealing of the opposed surfaces of the sheet material along intersecting lines corresponding to the ridges on the heated roll, thereby confining the liquid crystal composition within cells defined by said lines.

3,908,053

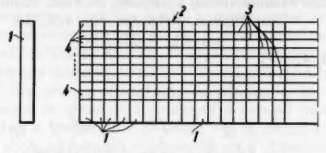
FINISHED PARQUET ELEMENT

Karl Hettich, Schloss Str. 22, D 7554 Kuppenheim, Germany

Filed Apr. 11, 1973, Ser. No. 350,299
Claims priority, application Germany, Aug. 7, 1972, 2238830; May 18, 1972, 7218713[U]
Int. Cl.[2] B32B 3/10, 3/14
U.S. Cl. 428—44 3 Claims

1. A ready made parquet element comprising a top portion of a substantially rectangular plate made of a plurality of small wooden boards flexibly interconnected by means of a bonding the material to form a single layer of wood;
   a bottom portion of a shock plate bonded on the bottom side of said layer of wood to serve as an insulating plate; a plurality of grooves formed in said shock plate and through a portion of the bottom surface of said single

layer of wood, thereby lending to the element sufficient flexibility so that it conforms to the unevenness of a base floor on which the element is placed and secured with a



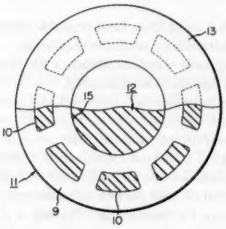
bonding material, thereby providing a seal for the element from all sides, and, a plurality of tongues and slots formed along the edges of said layer of wood to permit interengagement of adjacent parquet elements.

3,908,054

RESILIENT SUPPORTING UNIT FOR STRUCTURE SUCH AS BRIDGES

Norihito Ito, Tokyo, Japan, assignor to Nihon Kikaikougyou Kabushiki Kaisha and Kabushiki Kaisha Miwasyokai, both of Tokyo, Japan

Filed Apr. 8, 1974, Ser. No. 458,781
Int. Cl.[2] B32B *1/04, 3/10;* **E01D** *19/06;* **F16C** *27/06*
U.S. Cl. 428—64 **3 Claims**



1. A resilient supporting unit for a structure comprising upper and lower flat resilient members and a metal plate of ring configuration integrally embedded between said resilient members in the longitudinal direction, said plate having upper and lower surfaces with projections and grooves in a ring configuration.

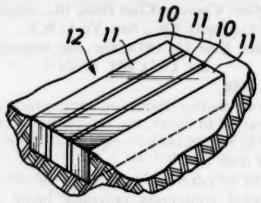
3,908,055

LUMINESCENT COLOR DEVELOPING PLATE

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino, and Kaoru Umeya, Sendai, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Division of Ser. No. 178,550, Sept. 8, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,217
Claims priority, application Japan, Sept. 22, 1970, 45-83582
Int. Cl.[2] E01F *9/08*
U.S. Cl. 428—67 **4 Claims**

1. A luminous color reflecting laminated plate embedded into and substantially in the plane of a road surface, said plate consisting of colored layers composed of: (1) from about 20 to about 35 percent by weight of a synthetic resin selected from the group consisting of high density polyethylene, polypropylene and polyvinyl chloride, (ii) from about 1 to about 10 percent by weight of a coloring amount of a luminous color-reflecting fluorescent or phosphorescent substance selected from the group consisting of calcium sulfide, zinc sulfide, cadmium sulfide and eosine in combination with a pigment or dye, and (iii) from about 55 to about 95 percent by weight of an inorganic filler selected from the group consisting of calcium sulfite, calcium sulfate, and their mixture, the sum of components (i)–(iii) amounting to 100 percent, compo-



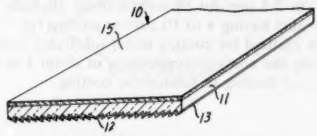
nents (ii) and (iii) thoroughly mixed and incorporated in said resin component (i), said colored layers being supported by at least one non-luminescent spacing layer.

3,908,056

OPTICALLY DECORATIVE WEB

Raymond H. Anderson, St. Mary's Point, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 10, 1973, Ser. No. 395,586
Int. Cl.[2] B44F *1/00*
U.S. Cl. 428—142 **30 Claims**



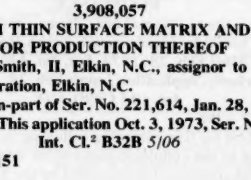
1. A web comprising
an elongate thin strip of polymeric material having opposite surfaces, one of said surfaces being smooth and the opposite surface being formed with a plurality of ridges and grooves, the surfaces forming the ridges producing in the presence of light an image such that the strip has an appearance other than that of a surface of said strip and said image would be other than coincident with said surfaces, and
a layer of adhesive applied to a surface of said strip.

3,908,057

FABRIC WITH THIN SURFACE MATRIX AND METHOD FOR PRODUCTION THEREOF

Alexander M. Smith, II, Elkin, N.C., assignor to The Fiberwoven Corporation, Elkin, N.C.

Continuation-in-part of Ser. No. 221,614, Jan. 28, 1972, Pat. No. 3,817,820. This application Oct. 3, 1973, Ser. No. 403,059
Int. Cl.[2] B32B *5/06*
U.S. Cl. 428—151 **50 Claims**



1. A fabric comprising textile fibers forming a body of a needled fabric, a face surface on the body of the fabric having surface fibers and segments of a plurality of individual fibers

contained in a surface matrix, the surface matrix being disposed on the face surface and being substantially parallel thereto, the segments of the individual fibers in the surface matrix being closely packed together and in random arrangement so that fibers cross over other fibers but the fibers are in planes substantially parallel to the plane of the surface matrix, other segments of the individual fibers being rooted and bound in the body of the fabric, the segments of the fibers contained in the surface matrix being bonded together, at least at cross-over points, by a polymeric resin which is disposed essentially only in the surface matrix and the amount of the polymeric resin being such that the surface matrix has a predominately fibrous character, and wherein the body of the textile fabric is characterized by highly entangled fibers and an overall bulk density of at least 8 pounds per cutic foot.

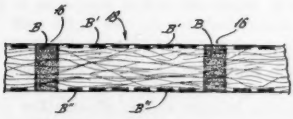
23. The fabric of claim 1 wherein the body of the fabric has fibers which are oriented into closely spaced rows of fiber chain entanglement.

3,908,058

SPOT-BONDED NONWOVEN FABRICS AND METHODS OF MAKING THE SAME

Gordon D. Russell, Chateauguay, and Rabindranath Roy, Montreal, both of Canada, assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 16, 1974, Ser. No. 433,625
Int. Cl.[2] B04H 3/12; B05D 1/28, 1/34, 1/36
U.S. Cl. 428—198 **11 Claims**



1. A strong, absorbent, abrasion-resistant, bonded nonwoven fabric comprising a fibrous layer containing staple length textile fibers and short fibers having less than textile staple length wherein the staple length fibers comprise up to 75% by weight of the fiber weight of the fibrous layer and the balance of the fiber weight in said layer is provided by the less than textile staple length fibers said fibrous layer being bonded by: (1) primary, intermittently-spaced, print pattern binder sites extending substantially from one surface of said fibrous layer to the other surface of said fibrous layer, said primary binder sites being spaced apart a distance less than the average length of staple length textile fibers but greater than the average length of short textile fibers; and (2) secondary, intermittently-spaced print pattern binder sites positioned predominantly on the surface of said fibrous layer and located between the intermittently-spaced binder sites of primary print pattern binder.

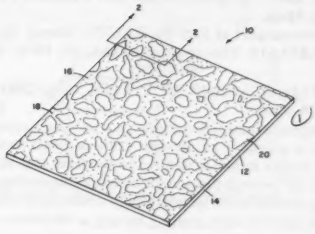
9. A method of making a strong, absorbent, abrasion-resistant, bonded nonwoven fabric comprising: forming a fibrous layer from staple length textile fibers and short fibers having less than textile staple length to provide a fibrous layer wherein the staple length fibers comprise up to 75% by weight of the fiber weight of the fibrous layer and the balance of fiber weight in said layer is provided by the less than textile staple length fibers; and bonding said fibrous layer with (1) primary, intermittently-spaced, print pattern binder sites extending substantially from one surface of said fibrous layer to the other surface of said fibrous layer, said primary binder sites being spaced apart a distance less than the average length of staple length textile fibers but greater than the average length of short textile fibers; and (2) secondary, intermittently-spaced, print pattern binder sites positioned predominantly on the surface of said fibrous layer and located between the intermittently-spaced binder sites of said primary print pattern binder.

3,908,059

DECORATIVE CEILING TILE

David S. Prince, Buffalo, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,077
Int. Cl.[2] D21H 1/10
U.S. Cl. 428—206 **10 Claims**



1. The method of forming three-dimensional designs on portions of the face of a ceiling tile, comprising the steps of mixing together a liquid binder and a large plurality of heat-expandable plastic particles of about 5 to 8 microns, applying said mixture as a thin, paint-like coating to design areas of the face of a ceiling tile, arranging said design area in relatively uniformly distributed areas throughout said tile face and leaving from about 10 to about 90 percent of the tile face uncoated between said distributed coated design areas, heating said tile face sufficiently to expand said plastic particles, and drying said binder, whereby a pleasing, relatively thick plurality of random plastic globules are formed in the said design areas.

3,908,060

ARTIFICIAL LEATHER AND METHOD OF PREPARATION

Kaoru Okazaki; Akira Higuchi, and Naoki Imaeda, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 298,449, Oct. 17, 1972, Pat. No. 3,841,897. This application Mar. 18, 1974, Ser. No. 451,915
Int. Cl.[2] B44D 1/14
U.S. Cl. 428—246 **25 Claims**

1. Artificial leather comprising a fibrous substrate having a thickness of about 0.3 to 3.0 mm, said fibrous substrate comprising a sheet of ultra fine fiber bundles and polymer impregnated therein, in which the denier of each fiber is about 0.01 to 1.0 denier, and coating layers (III), (II) and (I) adhered in that order to the surface of said substrate, with the coating layer (III) immediately on the surface of the substrate,

a. the coating layer (III) having a thickness of about 0.1 to 3.0 mm, and comprising a wet coagulated polymer composition which contains about 50 to 300 parts by weight of inorganic particles per 100 parts by weight of polymer, said inorganic particles having a mean particle diameter of about 0.03 to 5.0 micron and being essentially insoluble in water, and the polymer in this polymer composition consisting of at least about 60 percent by weight of polyurethane,

b. the coating layer (II) having a thickness of about 0.01 to 0.3 mm, and comprising a wet coagulated polymer composition which contains about 0 to 50 parts by weight of inorganic particles per 100 parts by weight of polymer, said inorganic particles having a mean particle diameter of about 0.03 to 5.0 micron and being essentially insoluble in water, and the polymer in this polymer composition consisting of at least about 80 percent by weight of polyurethane, and

c. the coating layer (I) having a thickness of about 0.001 to 0.1 mm and having a 20% modulus of about 5 to 100 kg/cm^2, and comprising a dry-coagulated polymer com-

position, consisting essentially of at least about 80 percent by weight of polyurethane.

3,908,061

COMPOSITE MATERIALS COMPRISING RESIN MATRIX AND CARBON FIBERS

Joseph B. Byrne, Antioch, Calif., and Harvey D. Ledbetter, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 233,751, March 10, 1972, Pat. No. 3,853,610. This application Oct. 16, 1974, Ser. No. 515,138

Int. Cl.² B32B *5/22;* **C04B** *35/52;* **C08K** *9/04;* **C08L** *67/06*

U.S. Cl. 428—288 **2 Claims**

1. A composite material comprising a polyester resin matrix containing a plurality of flexible carbon fibers said fibers having a Young's modulus parallel to the fiber axis of at least about 12×10^6 pounds per square inch and the surface of said fiber being coated with an essentially continuous coating of amorphous carbon, said coating having a thickness of from about 20A to about 200A and being obtained by deposition of a thermally carbonizable organic precursor onto the carbon fiber said organic precursor being thermally carbonized to amorphous form at temperatures less than 1,200°C.

3,908,062

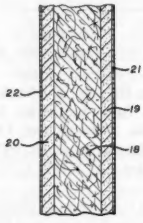
FIRE-RESISTANT, COMPOSITE PANEL AND METHOD OF MAKING SAME

James R. Roberts, Palatine, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jan. 21, 1974, Ser. No. 435,071

Int. Cl.² B32B *13/14, 13/08*

U.S. Cl. 428—282 **10 Claims**



1. A fire-resistant, composite panel, comprising

a core of rigid mineral fiber board, and

a layer of gypsum material bonded to one facing surface of said core, and

wherein

said core is a water-felted sheet comprising from about 5 to about 85 percent by weight of mineral wool, from about 5 to about 80 percent by weight of perlite, and from about 10 to about 30 percent by weight of a water-activated cellulosic binder, and

said gypsum material comprises alpha gypsum.

3,908,063

NOVEL TRANSFER ELEMENTS FROM POROUS ALKENYL AROMATIC FILMS

William Lee Rosendale, Miamisburg, and Ardyth Dale Lakes, Dayton, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sept. 27, 1974, Ser. No. 510,087

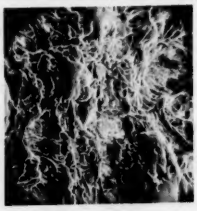
Int. Cl.² B41C *1/06;* **B41M** *5/02*

U.S. Cl. 428—320 **20 Claims**

1. An image producing transfer element comprising

a. an alkenyl aromatic resinous film having a porous ink receptive alkenyl aromatic resinous matter surface,

b. said resinous film having substantially uniformly distributed across its matte surface and retained therein a pressure expressible ink comprising a colorant dispersed in a relatively non-volatile polar vehicle.



3,908,064

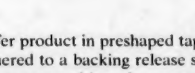
HEAT TRANSFER COMPOSITION TAPE

William A. Weidenbenner, Dallas, Tex., and Irvin J. Steltz, North Wales, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 258,277, May 31, 1972, abandoned. This application Apr. 30, 1973, Ser. No. 355,839

Int. Cl.² B32B *7/10, 5/16, 7/06*

U.S. Cl. 428—323 **18 Claims**



1. A heat transfer product in preshaped tape form comprising strippably adhered to a backing release sheet, a heat curing plastic, elongate composition, the composition consisting essentially of an intimate mixture of particulate solids having a thermal conductivity of at least 100 BTU/inch/hr./sq.ft./deg.F. in an amount of from about 15 to about 60 percent; epoxy resin present in an amount from about 15 to about 40 percent; dicyandiamide present in an amount of from about 1 to about 15 parts per hundred of epoxy resin; nitrile rubber present in an amount of from about 2 to about 15 percent; polybtutene present in an amount of from about 2 to about 15 percent; and asbestos fiber present in an amount of from about 3 to about 10 percent; said percentages being by weight based upon the weight of the composition.

3,908,065

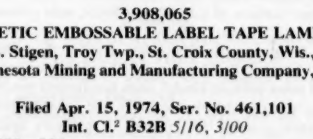
MAGNETIC EMBOSSABLE LABEL TAPE LAMINATE

Merritt L. Stigen, Troy Twp., St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 15, 1974, Ser. No. 461,101

Int. Cl.² B32B *5/16, 3/00*

U.S. Cl. 428—329 **6 Claims**



1. An embossable tape laminate including a light-transmitting plastic layer which is selectively opacified under deforming stresses to provide attractive labels, which plastic layer is bonded by an adhesive layer to a magnetized layer comprising permanent magnet particles and 9–40% by weight of polymeric nonmagnetic binder, which magnet-particle layer has a modulus of elasticity in tension of $0.1–1.0 \times 10^5$ psi and a BH_{max} of at least 0.7×10^6 gauss-oersteds and, adhered to the magnet-particle layer, a durable base layer of rubber or plastic

having a tensile strength of 1,500–6,500 psi and an elongation of 1–75%, the thickness of said tape and layers being within the following ranges:

	Thickness in micrometers
Stress-opacifying plastic layer	25 – 250
Adhesive layer	10 – 100
Magnet-particle layer	200 – 750
Durable base layer	1 – 20
Overall tape laminate	250 – 800

said tape laminate being embossable in an ordinary tape-embossing gun to provide attractive labels which magnetically adhere to ferromagnetic objects to be labelled.

3,908,066

PROTECTING METAL AND METAL PRODUCTS

Robert E. Parkinson, Monroeville Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 359,372, May 11, 1973, Pat. No. 3,839,256. This application Jan. 14, 1974, Ser. No. 432,922

Int. Cl.[2] **B32B** *15/08*; **H01B** *3/44*

U.S. Cl. 428—379 **15 Claims**

7. Metal coated with a dried composition comprising a solution or dispersion in an aqueous medium of

a. quaternary ammonium silicate of the formula $WM_2O{\cdot}X(N_nR_p)_2O{\cdot}Y\ SiO_2{\cdot}Z\ H_2O$ where W is a number from 0 to 1, X is a number from 0.33 to 1.5, Y is a number from 2 to 10, Z is a number from 1 to 20, M is an alkali metal, R is an organic radical that forms an NR base selected from alkyl, alkanol, and heterocyclic groups, each independently selected, having from 1 to 20 carbon atoms, *n* is an integer from 1 to 10, and *p* is at least 4, and b. ethylene polymer selected from the group consisting of copolymers, terpolymers and ionomers of ethylene with acrylic, methacrylic or crotonic acids or esters thereof or vinyl acetate, the weight ratio of SiO_2 derived from the quaternary ammonium silicate to ethylene polymer being from about 20:1 to about 1:20.

15. Wire having an electrically insulating dried coating thereon of a composition comprising a solution or dispersion in an aqueous medium of

a. quaternary ammonium silicate of the formula $WM_2O{\cdot}X(N_nR_p)_2O{\cdot}Y\ SiO_2{\cdot}Z\ H_2O$ where W is a number from 0 to 1, X is a number from 0.33 to 1.5, Y is a number from 2 to 10, Z is a number from 1 to 20, M is an alkali metal, R is an organic radical that forms an NR base selected from alkyl, alkanol, and heterocyclic groups, each independently selected, having from 1 to 20 carbon atoms, *n* is an integer from 1 to 10, and *p* is at least 4, and b. ethylene polymer selected from the group consisting of copolymers, terpolymers and ionomers of ethylene with acrylic, methacrylic or crotonic acids or esters thereof or vinyl acetate, the weight ratio of SiO_2 derived from the quaternary ammonium silicate to ethylene polymer being from about 20:1 to about 1:20.

3,908,067

FLAME RESISTANT POLYOLEFIN, METHOD OF PRODUCING SAME, AND INSULATED PRODUCT

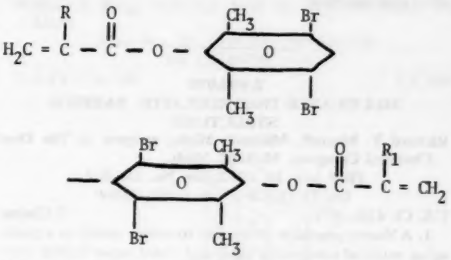
Burton Thornley MacKenzie, Jr., Monroe, and Maurice Prober, Fairfield, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,234

Int. Cl.[2] **H01B** *3/30*

U.S. Cl. 428—379 **24 Claims**

17. An insulated electrical conductor including a metallic conductive element having thereabout an insulation of flame resistant polyolefin compound comprising a polyolefin and an amount sufficient to effect flame retardance of a diacrylic acid ester of tetrabromotetramethyldiphenol and at least one unsaturated monocarboxlic acid selected from the group consisting of acrylic acid and an alkyl substituted acrylic acid having the formula:



wherein R and R_1 is hydrogen or an alkyl group.

3,908,068

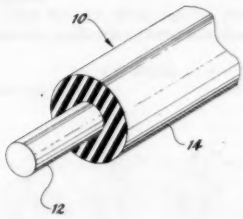
FIRE RETARDING SYSTEM FOR POLYMERIC COMPOSITIONS, AND A METHOD AND PRODUCTS COMPRISING THE SAME

Burton Thornley MacKenzie, Jr., Monroe, and Sidney Rothenberg, Fairfield, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sept. 26, 1973, Ser. No. 400,830

Int. Cl.[2] **B32B** *15/08*; **C08K** *3/22, 5/02*

U.S. Cl. 428—389 **6 Claims**



1. A flame resistant polymeric composition comprising polyethylene including the combination of the condensation reaction product of one mole of furan and two moles of hexachlorocyclopentadiene with at least one particulate metal oxide selected from the group consisting of ferric oxide and ferrous oxide, said condensation reaction product being present in the composition in an amount sufficient to provide about 8 to about 50 percent by weight of chlorine based upon the weight of the organic content of the composition and said metal oxide being present in an amount of about 3 to about 15 percent by weight of the organic content of the composition.

3,908,069

COATED PARTICULATE VINYL AROMATIC POLYMERS

Leslie A. Muirhead, Wilmslow, England, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 29, 1974, Ser. No. 456,329

Claims priority, application United Kingdom, Apr. 13, 1973, 17898/73

Int. Cl.[2] **B32B** *27/02*

U.S. Cl. 428—407 **9 Claims**

1. Coated unexpanded expandable particles of a polymer of a vinyl aromatic compound in which the coating is a straight

chain aliphatic substituted 1-hydroxyethylimidazoline in an amount sufficient to render the particles free flowing and having reduced tendency to agglomerate before, during and after preexpansion.

3,908,070

MULTILAYER THERMOPLASTIC BARRIER STRUCTURE

Richard T. Marzolf, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 24, 1972, Ser. No. 246,822
Int. Cl.[2] B32B *27/06;* **C08L** *23/04*
U.S. Cl. 428—474 **7 Claims**

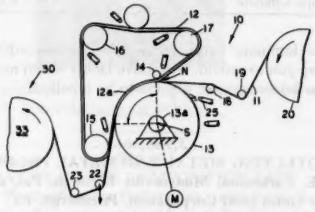
1. A thermoplastic multilayered structure useful as a packaging material comprising a gas and water vapor barrier core layer, juxtaposed thermoplastic adhesive layers on each side of said barrier layer, an outer polyolefin resin layer secured to one of said adhesive layers and an outer nylon layer secured to another of said adhesive layers, said barrier comprising a continuous coherent layer of a copolymer of vinylidene chloride and one or more olefinically unsaturated monomers copolymerized therewith, said adhesive layer comprising a blend, one of said blend components comprising a copolymer of ethylene and monocarboxylic acid and another of said blend components selected from a group consisting of a copolymer of ethylene and vinyl acetate, a copolymer of ethylene and ethyl acrylate, a copolymer of ethylene and isobutyl acrylate and chlorinated polymers of ethylene containing about 15 to 40 weight percent chlorine, said blend having a range of about 25 to about 75 weight percent of said blend components.

3,908,071

EXTERNAL SIZING OF EXTENSIBLE PAPER

Albert Heim, Wollerau, Zurich, Switzerland, and Ernest J. Groome, Covington, Va., assignors to Clupak, Inc., New York, N.Y.

Filed Oct. 10, 1972, Ser. No. 295,919
Int. Cl.[2] B05C *9/04;* **B44D** *1/092*
U.S. Cl. 428—537 **13 Claims**



1. A method for treating a compacted paper web to improve its tensile strength and stiffness while further improving its burst and TEA characteristics, comprising the steps of: taking paper which is extensible by having been compacted without creping, thus having improved burst, TEA and tear characteristics, and impregnating under pressure both sides of said web with a solution containing starch, while controlling the degree of moisture absorption from said solution by said web; and causing said web to be dried after impregnation with said starch solution; said web containing about 1 to 10% by weight starch.

3,908,072

METHOD AND FURNACE FOR THE MELT REDUCTION OF METAL OXIDES

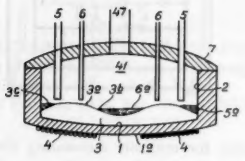
Per Harald Collin, Falun, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 21, 1974, Ser. No. 434,887

Claims priority, application Sweden, Jan. 23, 1973, 7300939-1

Int. Cl.[2] F27D 11/06

U.S. Cl. 13—26 13 Claims



1. A method for reducing metal oxides by feeding the oxides to the surface of a molten metal bath containing carbon and in which an upflow of the metal is caused to form an upstanding bulge free from slag and to which the oxides are fed for said reduction; wherein the improvement comprises inducing electric currents in said bath with a flux field pattern causing said bulge to form in the shape of a ridge having oppositely descending slopes of oppositely flowing molten metal.

3,908,073

FEEDING OF LIQUID INTO A LIQUID COOLED, HEAVY CURRENT CABLE

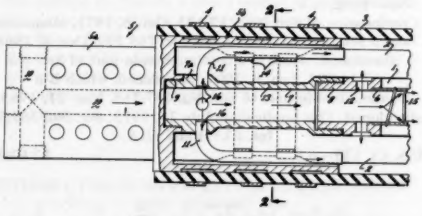
Ernst Hübner, Osnabruck, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte AG, Hannover, Germany

Filed Oct. 17, 1974, Ser. No. 515,517

Claims priority, application Germany, Oct. 20, 1973, 2352808

Int. Cl.[2] H01B 7/34

U.S. Cl. 174—19 4 Claims



1. Liquid cooled, heavy current cable having an inner tube, an outer tube and conductors inbetween the inner and outer tubes, further having a socket with a sleeve portion for receiving the ends of the conductors, the socket further provided with means for receiving cooling fluid and passing it to the interior of the sleeve portion, the improvement comprising a plurality of feeder tubes in the sleeve connected for receiving the said cooling fluid and passing it directly towards the space between the inner and outer tubes of the cable for flowing around the conductors in that space.

3,908,074

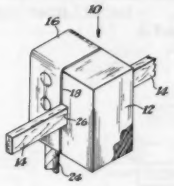
JUNCTION BOX BACK AND SUPPORT

William R. Berg, 1616 S.E. Sixth St., Deerfield Beach, Fla. 33441

Filed Nov. 27, 1974, Ser. No. 527,849

Int. Cl.[2] H02G 3/08

U.S. Cl. 174—58 2 Claims



1. A device for supporting an electrical outlet junction box within a walled enclosure comprising:

lightweight supporting block means, said block having a groove disposed along one surface;

an adhesive means disposed on the face having said groove coupling said block to the back of said junction outlet box.

3,908,075

LEAD FRAME SUPPORT FOR SEMICONDUCTOR DEVICES

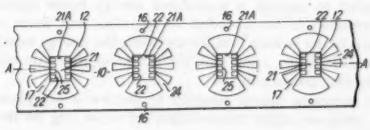
Sydney Jackson, Hayfield, and Alan Arthur Shepherd, Bramhall, both of England, assignors to Ferranti Limited, Hollinwood, England

Filed Nov. 17, 1972, Ser. No. 307,374

Claims priority, application United Kingdom, Nov. 20, 1971, 53985/71

Int. Cl.[2] H05K 1/18

U.S. Cl. 174—68.5 6 Claims



1. A support for semiconductor devices, comprising a flexible insulative strip including a plurality of rectangular recesses each having a supporting base and side walls and being distributed along the longitudinal axis of the strip, each recess including a lead frame for supporting a semiconductor device, each said lead frame comprising at least one matrix of conductors cranked at one end to provide end portions extending in a first plane, constituent conductors extending in a second plane and intermediate portions joining said constituent conductors to corresponding end portions, said end portions and intermediate portions extending into said rectangular recess, said end portions being wholly supported on said base, said first and said second planes being substantially parallel and said intermediate portions extending between said planes and at a right angle to said end portions and constituent conductors and contiguous to adjacent side walls of the recess, adjacent end portions of the conductors within the recess being spaced from each other and from the center of the recess to receive thereon and support within said recess a semiconductor device, the recess being such that with the associated semiconductor device being correctly oriented, a close fit in the recess is provided to ensure that each contact of the device

exclusively is contiguous with a cooperating end portion of a conductor of the lead frame extending in the recess.

3,908,076

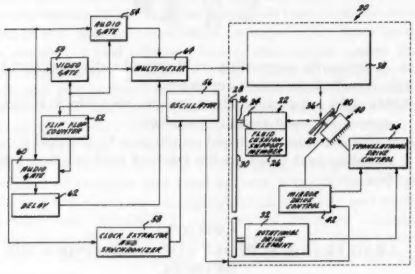
EXTENDED PLAY VIDEODISC RECORDING SYSTEM

Kent D. Broadbent, San Pedro, Calif., assignor to MCA Disco-Vision, Inc., Universal City, Calif.

Division of Ser. No. 299,892, Oct. 24, 1972. This application Jan. 28, 1974, Ser. No. 437,750

Int. Cl.² H04N 5/86

U.S. Cl. 178—6.7 A **7 Claims**



1. In combination with video disc writing apparatus including a turntable adapted to carry a disc, writing means including an arm, movable radially relative to the turntable and adapted to provide a modulated energy beam representing information to be recorded on the disc; and beam steering means in the writing arm for directing the energy beam in the radial direction; apparatus for producing an extended play video disc comprising:

a. receiving means adapted to receive a complete video program signal transmission for recording on the video disc;

b. audio extracting means coupled to said receiving means for separating the audio information portion from the video information portion of the received video program signal;

c. timing means coupled to said receiving means and responsive to predetermined synchronization signals in the video signal transmission for producing gating signals;

d. audio storage means for holding an audio portion of preselected duration, corresponding to a video program standard increment;

e. combining means coupled to said audio extracting means and said audio storage means for providing a combination audio signal including the audio portions from at least two program standard increments; and

f. write control means coupled to said timing means for applying to the writing means a modulating signal including the video portion of a selected program standard increment and the combination audio signal corresponding to the audio portion of the selected program standard increment and at least the last prior program standard increment, without modifying the video program standard increments or the sync or blanking intervals normally associated therewith.

3,908,077

METHOD FOR THE DETERMINATION AND/OR CONTROL OF DIMENSIONS OF AN OBJECT BEING SUPERVISED BY AN ELECTRONIC CAMERA

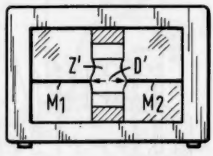
Hans Stut, Grobenzell, and Hans Leo Stiegler, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 24, 1973, Ser. No. 409,250

Claims priority, application Germany, Nov. 2, 1972, 2253789

Int. Cl.² H04N 7/02

U.S. Cl. 178—6.8 **2 Claims**



2. Apparatus for optically monitoring the image of the melting zone of a semiconductor rod in a crucible free melting process comprising means for generating an electron beam means for generating electrical pulses, a beam control circuit for controlling scanning the image including modulating means for modulating the beam with the electrical pulses to produce measuring marks M1, M2 representing the edges of the image, a coupling circuit (9) for coupling the electrical pulses from said pulse generating means to said beam control circuit, said pulse generating means including an auxiliary circuit including a pair of three-terminal semiconductor switches (22, 25) connected in series with said coupling circuit and a direct current voltage supply, means for applying adjustable period switching pulses to one of said semiconductor switches (22), said switching pulses being equal to each other and shorter in duration than the scanning duration of one line a source of the scanning pulses, and means for applying line scanning pulses to the other semiconductor switch (25).

3,908,078

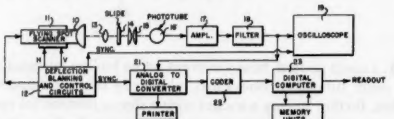
METHOD AND APPARATUS FOR DIGITAL RECOGNITION OF OBJECTS PARTICULARLY BIOLOGICAL MATERIALS

Sidney Auerbach, Avenel, N.J., and Alfred Lovitz, Jr., Columbus, Ohio, assignors to Object Recognition Systems, Inc., New York, N.Y.

Continuation of Ser. No. 187,193, Oct. 6, 1971, abandoned, which is a continuation of Ser. No. 765,235, Oct. 4, 1968, abandoned, which is a continuation-in-part of Ser. No. 614,994, Feb. 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 457,763, May 21, 1965, abandoned. This application July 25, 1973, Ser. No. 382,523

Int. Cl.² H04N 7/18

U.S. Cl. 178—6.8 **12 Claims**



1. Apparatus for producing a digital representation of an object to be recognized and for comparing its digital representation to a set of digital representations of known objects which comprises

means for scanning an object field in two dimensions at line and field scanning frequencies to produce a video signal representative of an object in said object field,

means including an analog-to-digital converter for producing at least several digital outputs during each field scansion, each of said digital outputs being proportional to the overall value of said video signal during a time period at least as long as approximately a line scanning interval of said video signal,

said at least several digital outputs being produced for at least a substantial portion of a field scansion at a rate such that the intervals of successive analog-to-digital conversions are at least as long as approximately a line scanning interval in said video signal,

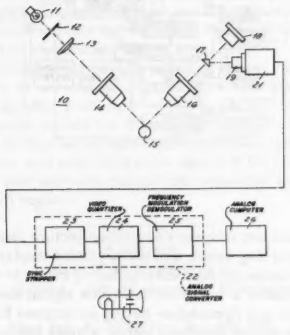
and means for comparing said at least several digital outputs with said set of ditigal representations of known objects.

3,908,079

SURFACE ROUGHNESS MEASUREMENT INSTRUMENT

Warren William Worthley, Fort Wayne, Ind., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,814
Int. Cl.[2] H04N 7/02
U.S. Cl. 178—6.8 **6 Claims**



1. A system for determining the roughness of a surface comprising:

a light-section microscope positioned to focus on the surface of a test specimen;

a television camera focused on the specimen through said microscope to provide a video output corresponding to the surface topography of said specimen;

a television signal to analog converter connected to said video output to provide a modified light intensity signal and an analog output signal; and

an arithmetic average analog computer connected to said analog signal.

3,908,080

METHOD OF MAKING AN EXTENDED PLAY VIDEO DISC RECORD

Kent D. Broadbent, San Pedro, Calif., assignor to MCA DiscoVision, Inc., Universal City, Calif.

Division of Ser. No. 299,892, Oct. 24, 1972. This application Jan. 28, 1974, Ser. No. 437,749
Int. Cl.[2] H04N 5/76, 5/86
U.S. Cl. 178—6.6 R **4 Claims**

1. The method of making an extended play video disc record comprising the steps of:

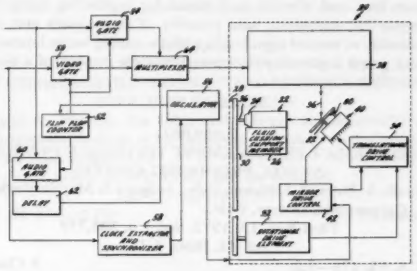
a. receiving at least two complete sequential video program standard increments;

b. extracting the audio portion from said received video program standard increments;

c. storing at least one of the extracted audio portions;

d. combining a first audio portion with subsequent audio portions; and

e. continuously recording the video portion of only one of said received video program standard increments together in simultaneity with the combined audio portions of all of the received video program standard increments, without altering said video program standard increments or the sync or blanking intervals normally associated therewith.

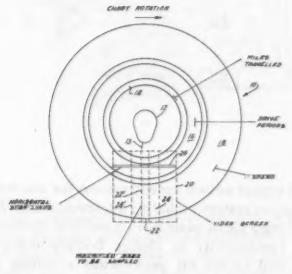


3,908,081

APPARATUS FOR CONVERTING GRAPH DATA INTO A FORM SUITABLE FOR COMPUTER PROCESSING

Earl Greenberg, Whitestone, N.Y., assignor to Efficient Instruments Corporation, Long Island City, N.Y.

Filed Feb. 3, 1972, Ser. No. 223,111
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 **45 Claims**



1. An apparatus for converting the information on a chart marked with a vehicle trip-recorder graph into suitable form for analysis by a computer, said apparatus comprising scanning means for scanning successive areas of at least a portion of the vehicle trip-recorder graph with a scanning beam; first generating means for generating a first signal when said scanning beam encounters a marking on the area being scanned; second generating means for generating a second signal corresponding to the position of said scanning beam when said beam encounters a marking on the area being scanned; and means for registering the information represented by said first and second signals, wherein the trip-recorder graph is a graph of the magnitude of at least one vehicle trip variable plotted with respect to time, and wherein said apparatus comprises means for positioning the graph stationarily with respect to said scanning means during the scanning of the graph with such an orientation that during the tracing of at least some scanning lines said scanning beam intersects said graph a plurality of times, and wherein said first generating means comprises means for generating a plurality of first signals

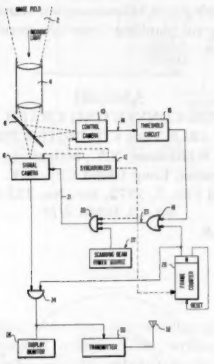
respectively corresponding to the plurality of times said scanning beam intersects the graph during the tracing of a single scan line, and wherein said second generating means comprises means for generating a plurality of second signals respectively corresponding to the plurality of times said scanning beam intersects said graph during the tracing of a single scan line, and wherein said means for registering comprises means for registering said plurality of first signals and said plurality of second signals when said scanning beam intersects said graph a plurality of times during the tracing of a single scan line.

3,908,082

DIM OBJECT ENHANCEMENT TECHNIQUE IN VIDEO SIGNAL PRODUCING SYSTEM

Leslie A. Pownall, Littleton, Colo., assignor to Martin Marietta Corporation, Denver, Colo.

Filed Nov. 13, 1972, Ser. No. 305,775
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **5 Claims**



1. A dim object enhancement system for use with a video signal producing system including a television signal camera of the type having a signal plate having induced thereon a pattern of varying conductivity or charge corresponding to image brightness, and means for periodically scanning said signal plate with an electron beam to neutralize the charge on said signal plate and produce an electrical video signal having an amplitude varying in proportion to the charge on said signal plate, one complete scan of said signal plate constituting a frame, said enhancement system comprising:

a. a television control camera of the same type as said television signal camera and positioned to receive the same optical image received by said television signal camera;

b. analog threshold means connected to receive the electrical video signal from said television control camera for generating a threshold signal when said electrical video signal from said television control camera exceeds a predetermined threshold level;

c. gate means responsive to said threshold signal for blanking said electron beam in said television signal camera in the absence of said threshold signal; and

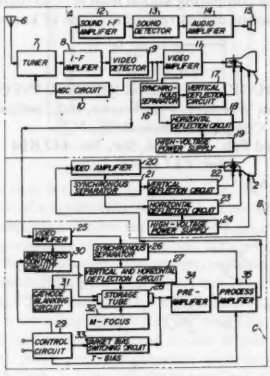
d. frame counter means synchronized with said means for periodically scanning and connected to said gate means for inhibiting the blanking of said electron beam by the presence of said threshold signal periodically after a predetermined number of frames.

3,908,083

TELEVISION RECEIVER

Hisao Hiraki, Nishinomiya; Seiro Hasegawa, Ikeda, and Hiroshi Shirakusa, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 272,951, July 18, 1972, abandoned. This application July 1, 1974, Ser. No. 485,022
Claims priority, application Japan, July 20, 1971, 46-54493
Int. Cl.² H04N *5/44*
U.S. Cl. 178—7.5 R **4 Claims**



1. A television receiver comprising: picture display means, picture recording means and static picture display means;

a. said picture display means including means to receive and demodulate a broadcast television signal, said means to receive and demodulate having an antenna for receiving the broadcast television signal, a tuner connected to the antenna and a video detector for demodulating the television signal,

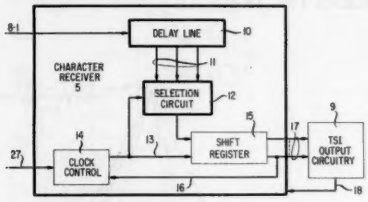
b. said picture recording means including a storage tube to record a particular frame of video signal and having a single electron gun and first vertical and horizontal deflection coils, first vertical and horizontal deflection means to vary the amount of deflection current passing through the first deflection coils of said storage tube at the time of reading out a recorded video signal therein and control means to read out the recorded signal of said storage tube repetitively, said first vertical and horizontal deflection means having two amplifiers connected to the respective first vertical and horizontal deflection coils of said storage tube and two variable resistors for coupling vertical and horizontal saw-tooth wave signals to said respective amplifiers, said two variable resistors being ganged together and controlled manually to control the deflection of a scanning spot on a target of said storage tube for the purpose of zooming a static picture, said control means automatically starting to read out the content of said storage tube after the particular frame of video signal is recorded in said storage tube,

c. said static picture display means including a picture tube having second vertical and horizontal deflection coils for displaying the video signal read out or zoomed by said picture recording means, second vertical deflection means and second horizontal deflection means each causing deflection current to pass through the respective second vertical and horizontal deflection coils on said picture tube.

3,908,084
HIGH FREQUENCY CHARACTER RECEIVER

Paul Ronald Wiley, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 7, 1974, Ser. No. 513,035
Int. Cl.[2] H04J 3/00
U.S. Cl. 178—69.5 R 15 Claims



1. For use in a data receiver having

a delay line for receiving character start and data pulses and providing at least three output ports each of which supplies a different delay signal sample of said start and data pulses,

a source for supplying clock pulse signals,

a shift register for receiving start and data pulses serially via said delay line ports and supplying said received pulses in parallel to a utilization means,

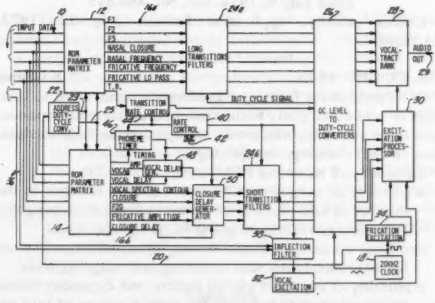
the improvement comprising selection means including

a plurality of subcircuits responsive to a receipt of delay signal samples from said output ports and to supplied clock pulse signals for selecting delayed start and data pulses on any one of said output ports for synchronized operation with said clock pulse signals in the transmission of said start and data pulses from said delay line ports to said shift register.

3,908,085
VOICE SYNTHESIZER

Richard T. Gagnon, 307 Wadsworth, Birmingham, Mich. 48010

Filed July 8, 1974, Ser. No. 486,506
Int. Cl.[2] G10L 1/08
U.S. Cl. 179—1 SG 18 Claims



1. In a voice synthesizer for phoneticly synthesizing human speech:

a vocal tract model comprising tunable filters and amplitude control devices responsive to input signal quantities to determine the frequency and amplitude parameters of phonemes to be output therefrom;

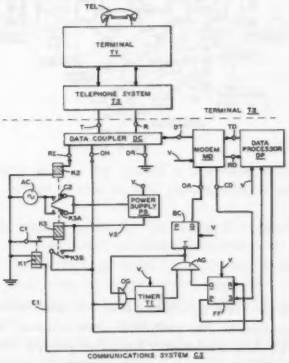
input means for specifying selected phonemes to be output from said vocal tract model and said parameters thereof in a predetermined order;

and control signal forming means connected between said input means and said tunable filters and amplitude control devices of the vocal tract model for producing a plurality of variable duty cycle waveforms as input signals for controlling the frequency and amplitude characteristics of the selected phonemes.

3,908,086
METHOD FOR ESTABLISHING A DATA COMMUNICATION CONNECTION BETWEEN TWO FULL DUPLEX MODEMS

Francis C. Marino, Dix Hills, and Edward Krummenacker, Smithtown, both of N.Y., assignors to Redactron Corporation, Hauppauge, N.Y.

Filed June 3, 1974, Ser. No. 475,510
Int. Cl.[2] H04M 11/06
U.S. Cl. 179—2 DP 2 Claims

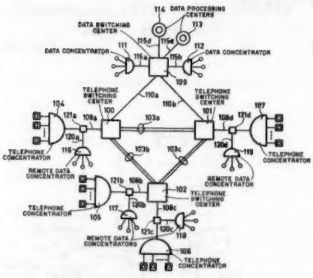


1. In a data communication system wherein at least a pair of full duplex modems are connected together by a telecommunication system to communicate through the transfer of frequency shift keyed carrier signals and wherein at least one of the modems is initially unpowered, a method of establishing a data communications connection between the modems by forcing the condition that one of the modems operates in an originating operating mode with a first frequency band and the other modem operates in an answering operating mode with a second frequency band, said method comprising the steps of a first of the modems in one of the operating modes calling a second of the modems, the second modem being unpowered, applying power to the second modem in response to the call of the first modem, forcing the second modem into an arbitrary one of the operating modes, the first modem transmitting carrier signals in the frequency band associated with its present operating mode, the second modem sensing for the receipt of such carrier signals from the first modem, if such carrier signals are sensed within a predetermined time activating data transfer routines between the two modems, if such carrier signals are not sensed within the predetermined time forcing the second modem to switch to the other operating mode and to again sense for the receipt of such carrier signals, and when such carrier signals are then sensed by the second modem activating the data transfer routines.

3,908,087
TIME-DIVISION TELECOMMUNICATION SYSTEM FOR THE TRANSMISSION OF DATA VIA SWITCHED CONNECTIONS

Thijs Krol, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,218
Claims priority, application Netherlands, May 23, 1973, 7307169
Int. Cl.² H04J 3/06
U.S. Cl. 179—15 AF 1 Claim

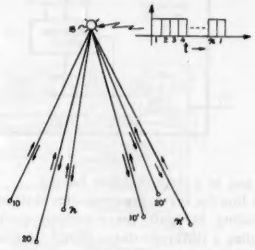


1. Time division multiplex telecommunication system for data transmission via switched connections, which system comprises a data transmitter for pulse groups which are transmitted in different pulse group positions of consecutive multiplex frames, a transmission highway using time division, means for sending the pulse groups of the pulse transmitter via the transmission highway in one time slot of a cyclic sequence of time slots, which time slot characterizes a time channel, a switching system having a plurality of incoming and outgoing transmission highways, which switching system includes means for connecting the time channels of the incoming transmission highways to arbitrary time chanels of the outgoing transmission highways, characterized in that the data transmitter includes means for continuously transmitting stuffing pulse groups in a particular pulse group position of the multiplex frame, in that the switching system comprises an internal outgoing transmission highway and an internal incoming transmission highway, in that the incoming time channel of the incoming transmission highway which is connected to the data transmitter is connected to three time channels of the internal outgoing transmission highway, in that a device connected to this transmission highway is provided for restoring the sequence of pulse groups supplied by the incoming time channel from the sequence of pulse groups which are received in the three time channels, in that means are provided for converting the pulse repetition rate of the restored sequence of pulse groups to the pulse repetition rate of an outgoing time channel by the addition or removal of stuffing pulse groups, in that means are provided for applying the converted sequence of pulse groups to an internal incoming time channel of the internal incoming transmission highway, and in that in order to complete the connection the internal incoming time channel is connected to a time of an outgoing transmission highway.

3,908,088
TIME DIVISION MULTIPLE ACCESS COMMUNICATIONS SYSTEM

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,320
Int. Cl.² H04J 3/06
U.S. Cl. 179—15 BC 5 Claims



1. In a multiple access communications system, the combination therewith of:

first means for generating a pair of coded signals;

second means for generating a timing reference signal; and third means for multiplexing said coded signals with said timing reference signal for communication of said coded signals to users accessing said system at predetermined assigned intervals of time;

and wherein said first-mentioned means generates a pair of coded signals which upon receipt and detection by a user accessing the system produces an output signal having an impulse autocorrelation function during his assigned, predetermined interval of time within said timing reference signal.

3,908,089
CIRCUIT FOR ADDING A PARTY TO A CONFERENCE IN A PCM EXCHANGE

Jean A. Picandet, Paris, France, assignor to Jeumont-Schneider, Puteaux, France

Filed July 9, 1974, Ser. No. 486,815
Claims priority, application France, July 12, 1973, 73.25580
Int. Cl.² H04M 3/56
U.S. Cl. 179—18 BC 8 Claims

1. Apparatus for forming a conference connection to connect an additional party to an existing multiple party connection in an automatic electronic multiplex pulse code modulation (PCM) exchange comprising:

a plurality of incoming PCM lines,

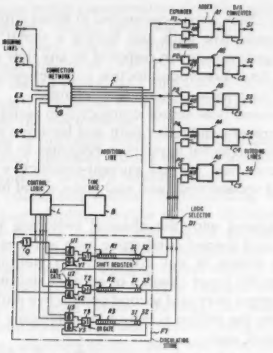
a plurality of outgoing PCM lines equal in number to the number of said plurality of incoming lines, each outgoing PCM line providing outgoing PCM signals,

exchange connection means having input and output means for interconnecting said incoming and outgoing lines,

a plurality of expander circuit means, one expander circuit means connected between the output means of said exchange connection means and each outgoing PCM line, an additional PCM line for each additional party providing PCM signals, said additional line connected between the output means of said exchange connection means and to routing means, said routing means providing additional party PCM signals in the same time slot as the existing multiple party connection,

additional expander means for each additional party, said expander means connected to said routing means for

providing expanded additional party PCM signals, and



means for adding said expanded additional party PCM signals to said outgoing PCM signals in said existing multiple party connection.

3,908,090

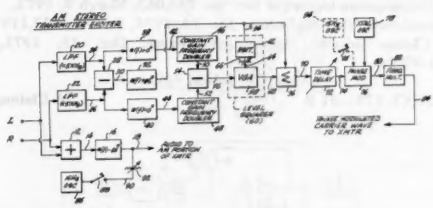
COMPATIBLE AM STEREOPHONIC TRANSMISSION SYSTEM

Leonard R. Kahn, 70 N. Grove, Freeport, L.I., N.Y. 11520

Continuation-in-part of Ser. No. 251,947, May 10, 1972, abandoned. This application July 10, 1974, Ser. No. 487,155

Int. Cl. H04h *5/00*

U.S. Cl. 179—15 BT **19 Claims**



1. The method of developing a compatible AM stereophonic electromagnetic energy transmission, comprising:

a. amplitude modulating an electromagnetic carrier wave with the sum of the stereophonically related signals, and

b. phase modulating the said carrier wave with a composite stereo difference signal, said difference signal being essentially comprised of the summation of:

1. the fundamental of the difference signal, and

2. the difference signal developed from the second harmonics of the stereo related signals, signal (2) being about 13% of the level of signal (1) at full stereo modulation and being maintained in substantially a square law relation with respect to signal (1).

3,908,091

DIAL PULSE CORRECTION CIRCUIT FOR TELEPHONE SIGNALING SYSTEM

Gary C. Waldeck, Scottsdale, Ariz., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 13, 1974, Ser. No. 442,028

Int. Cl.[2] H04Q *1/36*

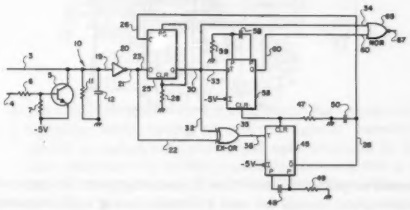
U.S. Cl. 179—16 EA **9 Claims**

1. A dial pulse correction circuit responsive to received-input dial pulse signals with break and make pulse intervals which are each greater than a first prescribed minimum time interval for producing corrected dial pulse signals with break pulse intervals of at least a second prescribed minimum time interval, comprising:

first-control means responsive to transitions of a binary dial pulse input signal for changing the binary logic level of the output thereof;

second-timing means normally operating for producing an output of one logic level and being triggered in response to at least certain changes in the output logic level of said first means that are of one polarity to produce an output of another logic level for only a period of time that is equal to the first time interval;

third-sample storage means responsive to the change in the output of said second means from the another to the one logic level in going back to its normal operating state for sampling and storing the logic level of the input signal, the logic level stored by said third means being changed only when the logic level of the input signal is the same value at



the beginning and at the end of a first time interval over which the output of said second means is the another logic level;

fourth-timing means normally operating for producing an output of one logic level and being responsive to a change of one polarity of the logic level stored by said third-storage means for producing an output of another logic level for a period of time that is equal to the second prescribed time interval; and,

fifth-control means being responsive to a signal stored by said third means of only one of the binary logic levels for operating to cause the output thereof to be of one logic level, and also being responsive to the another logic level output signal from said fourth-timing means for operating to cause the output thereof to be of the same one logic level; the corrected dial pulse signal being the output signal of said fifth means which is of the one logic level for at least a period of time that is equal to the second time interval.

3,908,092

PROGRAM CONTROLLED TIME DIVISION SWITCHING SYSTEMS

Stuart Lee Hight, deceased, late of Thornton, Colo., by Nancy C. Hight, executrix, Albuquerque, N. Mex.; John Christian Moran, Broomfield, and Nelson Tsin Tsao-Wu, Boulder, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

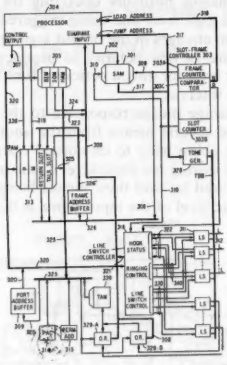
Filed Dec. 21, 1973, Ser. No. 427,325

Int. Cl. H04j *3/00, 3/16*

U.S. Cl. 179—18 ES **17 Claims**

1. In a stored program controlled switching system having processing means, a a time division switching network and a plurality of line switches each of which is connected to said network, means operative under control of said processing means for assigning to a call received by said system a unique time slot from a repetitively recurring series of time slots, means responsive to said time slot assignment for generating the identity of each one of said line switches serving said call, means operative in cooperation with said generating means for closing each of said line switches serving said call during each occurrence of said unique time slot assigned to said call,

means responsive to said time slot assignment for assigning to said cell a unique time frame from a repetitively recurring series of time frames, and means including said processing



means responsive to said time frame assignment for processing information signals for said call only during each occurrence of said unique time frame.

3,908,093

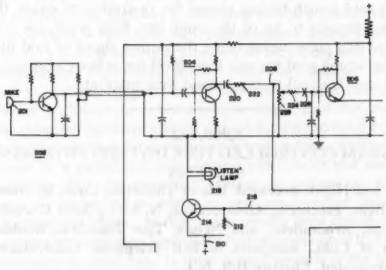
INTERCOM SYSTEM WITH AN IMPROVED MECHANISM FOR PREVENTING THE INTERRUPTION OF CONVERSATIONS

Wayne Riley, Racine, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed Oct. 18, 1973, Ser. No. 407,470

Int. Cl.[2] H04M 9/00

U.S. Cl. 179—37 **9 Claims**



1. An intercom system including a plurality of stations each having a voice signal input channel and a separate voice signal output channel and each including channel switching means for connecting the voice signal output channel of the station to the voice signal input channel of another station at times when it is desired to establish voice communication between the two stations, wherein the improvement comprises:

a first node at a first potential and a second node at a second, different potential within each station;

at least one first current-conductive path connecting said first node to the voice signal output channel of each station;

at least one second current-conductive path connecting said second node to the voice signal input channel of each station;

a first current flow sensor connected in series with said first current-conductive path and having a signal output at which a signal appears in response to any flow of current over said first current-conductive path between said first node and said voice signal output channel;

a second current flow sensor connected in series with said second current-conductive path and having a signal output at which a signal appears in response to any flow of current over said second current-conductive path between said second node and said voice signal input channel;

means associated with the channel switching means for breaking said second conductive path at times when the switching means is not connecting a station's output channel to the input channel of another station so that a flow of current over said second conductive path can only occur when the station is busy communicating with some other station; and

means responsive to a signal output from the first current flow sensor and the absence of a signal output from the second current flow sensor for preventing the station from supplying a voice output signal to its voice signal channel output, thereby preventing a first station from transmitting a voice signal to a second station that is busy but permitting the first station to transmit when the apparently-busy second station is switched for communication back with a first station and is thus not truly busy.

3,908,094

TELEPHONE TRANSCEIVER WITH AMPLIFIED MICROPHONE AND SPEAKER

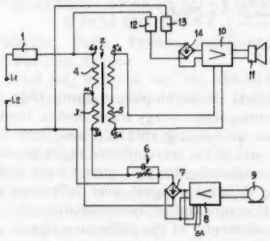
Andre Deluegue, Issy-les-Moulineaux, France, assignor to Central Telephone S.A., Ossu, France

Continuation-in-part of Ser. No. 233,063, March 9, 1972, abandoned. This application Jan. 14, 1974, Ser. No. 433,119

Claims priority, application France, Dec. 15, 1971, 71.45024

Int. Cl.[2] H04M 1/60

U.S. Cl. 179—81 B **15 Claims**



1. In a telephone transceiver of the type employing an amplified loudspeaker and an amplified microphone within the same housing, the improvement comprising:

transformer means, said transformer means including a center-tapped primary winding and a secondary winding;

means for coupling the secondary winding of said transformer means to the loudspeaker, said coupling means including first amplifier means having a pair of input terminals connected to opposite ends of said transformer means secondary winding;

first connecting means connecting a first end of said transformer means primary winding to a first terminal of a two wire telephone network;

balancing circuit means for connecting the second end of said transformer means primary winding to the second terminal of a two wire telephone network;

second amplifier means having input terminals and a pair of output terminals, said second amplifier means input terminals being connected to the microphone, said second amplifier means including an output stage connected across said output terminals and having the operating characteristics of a variable resistance, said second amplifier means providing a modulated direct current output signal in response to a modulated input signal received from the microphone;

second connecting means for connecting a first of said second amplifier means output terminals to the second telephone network terminal; and

third connecting means for connecting the other of said second amplifier means output terminals to the center-tap of said transformer means primary winding, said second amplifier means modulating the transformer means primary winding direct current to produce currents which are equal and in phase in both halves of said center-tapped primary winding, the magnetic fields generated by said in-phase currents being substantially mutually cancelling so that there will be no current induced in the transformer secondary winding.

3,908,095

MICROPHONE-SPEAKER DEVICE

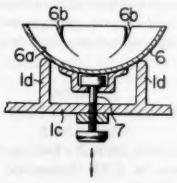
Sei Jinsenji, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 15, 1972, Ser. No. 289,746

Claims priority, application Japan, Sept. 28, 1971, 46-75650

Int. Cl. H04r *1/00*

U.S. Cl. 179—102 **1 Claim**



1. A hand-held tape recording device comprising

a. a casing dimensioned to be held in the human hand, having an opening for passage of sound between the interior and exterior of the casing;

b. a concave elliptic sound reflector having first and second foci and mounted within said casing in facing relation to said opening for directionally reflecting sound between said first focus and a locality external to said casing, said first focus being located within the casing and said second focus being at said external locality;

c. transducer means for receiving and emitting sound, supported by said casing and disposed at said first focus in facing relation to said reflector for receiving sound entering said casing through said opening from said external locality and reflected to said first focus by said reflector and for emitting sound for reflection by said reflector through said opening to said external locality;

d. tape recording means contained within said casing and connected to said transducer means, for recording and reproducing sound; and

e. means for varying the curvature of said reflector, said reflector having plural radial splits to facilitate variation in curvature thereof, and said curvature-varying means comprising means carried by said casing for moving the center of said reflector in a direction aligned with the axis of said reflector.

3,908,096

ELECTROMAGNETIC PICKUP CARTRIDGE WITH TENSION WIRE AND INDUCTION MAGNET ALINED AXIALLY WITH ARMATURE

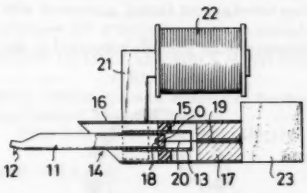
Yonezo Furuya, Tokyo, Japan, assignor to Micro Labo Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1973, Ser. No. 428,765

Claims priority, application Japan, Dec. 28, 1972, 47-1839; Oct. 16, 1973, 48-120053

Int. Cl.² H04R *11/08*

U.S. Cl. 179—100.41 Z **11 Claims**



1. An electromagnetic type pickup cartridge comprising:

a cartridge body having an electromagnetic transducing circuit including pole pieces and coils arranged to function cooperatively within a cartridge housing and a permanent magnet installed in a specific position within said cartridge housing; and

a stylus assembly detachably installed in said cartridge body and comprising

a cantilever arm having front and rear ends,

a stylus provided at said front end of said arm,

a tubular armature provided at the rear part of the arm, a tubular guard member surrounding said armature and having corresponding front and rear ends,

a damper holding within said guard member the armature in a manner permitting free swinging vibration thereof at a position apart from a rear end of the armature with a predetermined distance,

a piece of wire connected at a front end thereof to the armature at a point substantially in the vicinity of a point coinciding with a central point of the damper in the diametric and axial directions thereof, said wire imparting a tensile force to the armature and cantilever arm in the direction from said front end toward said rear end of the armature, and

a magnetic member provided on the rear end part of said guard member with a clearance relative to the armature whereby the vibration of the armature will not be obstructed, rear end of the wire being fixed to said magnetic member, said magnetic member facing the permanent magnet when the stylus assembly is inserted into the cartridge body,

said armature confronting said pole pieces and, at the same time, being magnetized by the permanent magnet via the magnetic member when the stylus assembly is inserted into the cartridge body.

3,908,097

HEADSET WITH REVERSIBLE EARCUP

Robert K. Higgins, Jr., Cheraw, S.C., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

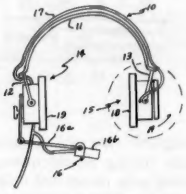
Filed May 21, 1974, Ser. No. 471,932

Int. Cl.² H04M *1/05*

U.S. Cl. 179—156 A **1 Claim**

1. A communications headset comprising; a resilient headband having a main headband portion positionable over or around the head of a wearer and terminating in depending and opposite end portions disposed adjacent or nearly adjacent the ears of the wearer; a communications cord disposed around

said headband and further respectively mounting to the opposite end portions thereof a pair of earphone/earcup-yoke member-holding means respectively attached to the said headband-opposite end portions; a first earphone/earcup member receiving a first end portion of the communications cord and disposed in a supporting and rotatable relation to one of the said earphone/earcup-yoke member-holding means about pivot points centrally disposed on opposite sides of the circumference of said first earphone/earcup member for thereby accommodating one side of the specific head configuration thereto; a microphone mounted to, and providing for only a relatively limited or restrained rotation to said first earphone/earcup member and further positioned with its head adjusted adjacent or nearly adjacent to the wearer's mouth; a second earphone/earcup member supported in the other of



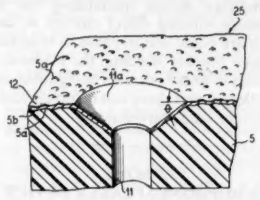
said earphone/earcup-yoke member-holding means similarly disposed about pivot points centrally disposed on opposite sides of the circumferences of said second earphone/earcup member; each of said earphone/earcup members having a first, main, relatively enlarged and toroidal-shaped cushioned element incorporated on its normally inwardly-facing side and normally disposed in an all-encompassing, sealed and first, headset-communicating position around and over the ears of the wearer; said yoke-member holding means for said second earphone/earcup member having a pair of relatively wide, spread-apart yoke arms respectively terminating at the said centrally-disposed, pivot points on each side of a somewhat reduced diameter and flat rear surface portion of said second earphone/earcup member and thus providing a sufficient clearance space to enable the complete reverse rotation of said second earphone/earcup member in a counterclockwise direction approximately 180° with the said first, main, relatively enlarged cushioned element being thereby removed from the appropriate ear and disposed both for an extended and relatively unrestrained rotation from said normally inwardly-facing and first, headset-communicating position with said first, main, relatively enlarged cushioned element sealed against the corresponding ear of the wearer to a second, outwardly-facing and non-headset-communicating position with the said first, relatively enlarged cushioned element facing away from, and the reduced size and flat rear surface-portion of said second earphone/earcup member now disposed against the head of the wearer to one side of and thereby completely exposing the said corresponding ear of the wearer to direct verbal communication with nearby personnel, while, simultaneously, insuring and thereby allowing the other earcup to remain against its corresponding ear for the monitoring of incoming messages over the headset through the appropriate end of the communications cord; a second communications cord-end portion integrally formed with said first communications cord-end portion and elongated for interconnection with said second earphone/earcup member through the circumference thereof specifically adjacent to a selected one of its pivot points to the corresponding yoke arm to thereby expressly provide clearance with, and thus ensure the said relatively unrestrained rotation of the second earphone/earcup member between its first, normally-inwardly facing position and its second outwardly-facing position away from the wearer's ear; and a second, relatively enlarged, separate and flat padding element formed on and completely covering the flat rear surface portion of, and thus enabling the relatively comfortable positioning of and specifically accommodating the said second earphone/earcup member for substantially prolonged periods to the head of the wearer when in its second, non-headset-communicating position.

3,908,098

ELECTROSTATIC TRANSDUCER

Hirotake Kawakami; Yoshihiro Yokoyama, and Tooru Fukumoto, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 30, 1973, Ser. No. 383,990
Claims priority, application Japan, Aug. 4, 1972, 47-78103
Int. Cl.[2] H04N *19/00*
U.S. Cl. 179—111 R **5 Claims**



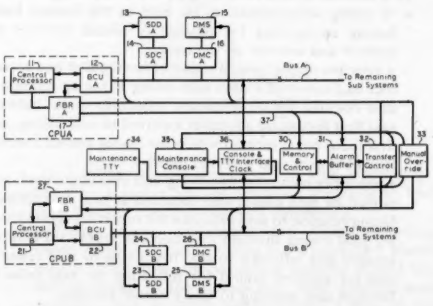
1. An electrostatic transducer comprising:
a housing,
a planar base having a plurality of apertures therethrough, said apertures having smooth counterbores tapered between 10° to 40° providing outwardly flaring openings on one side and the remaining portions of said one side formed with numerous bumps,
an electrical conductive surface formed on said base in said smooth counterbores and said remaining portions, and
an electrically conductive diaphragm mounted in said housing in closely spaced position above said one side.

3,908,099

FAULT DETECTION SYSTEM FOR A TELEPHONE EXCHANGE

Robert A. Borbas, and John R. Dufton, both of Brockville, Canada, assignors to GTE Automatic Electric (Canada) Limited, Brockville, Canada

Filed Sept. 27, 1974, Ser. No. 510,093
Int. Cl.[2] H04M *3/24*
U.S. Cl. 179—175.2 R **18 Claims**



1. In a telephone exchange of the type which includes a first common data bus, a second common data bus, a first plurality of subsystems dedicated only to said first common data bus, a second plurality of subsystems dedicated only to said second common data bus and a third plurality of subsystems common to both of the first and second common data buses, wherein only one common data bus and its associated dedicated sub-

systems are operatively on line with the third plurality of subsystems at any instant in time for providing requested telephone subscriber service, and whrein each of the first and second dedicated subsystems includes a program memory for storing a plurality of operational codes including a plurality of test instructions, and a central processor for controlling the operation of its associated dedicated subsystems and the third plurality of subsystems in response to its program memory operational codes, a fault detection system for transferring the control of the telephone exchange from the presently on line common data bus and its associated dedicated subsystems over the off line common data bus and its associated dedicated subsystems, said fault detection system comprising:

monitoring means for monitoring the operation of the on line common data bus and its associated dedicated subsystems for providing a first multiple bit status word indicative of the operative conditions of the on line common data bus and its associated dedicated subsystems;

means coupled to said monitoring means for storing said first multiple bit status word;

status word updating means coupled to said monitoring means and said storing mea.ns for updating said first status word to indicate the current operative status of the on line common data bus and associated dedicated subsystems and for setting a bit within said first status word indicating a request for a first test routine;

means for transmitting said first status word to the on line central processor for causing it to obtain a first test instruction from its program memory and for acting thereupon;

clock means coupled to said monitoring means for setting a predetermined time period and for providing a control signal when the on line common bus and its associated dedicated subsystems fail to complete the first test instruction routine within said predetermined time; and

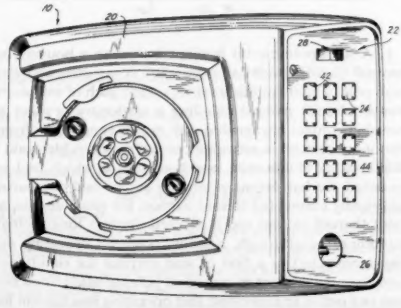
transfer means coupled to said clock means and to said dedicated subsystems for transferring the control of the telephone exchange from the on line common data bus and its associated dedicated subsystems over to the off line common data bus and its associated dedicated subsystems in response to said control signal.

3,908,100

TOUCH BLEND SMOOTH SURFACE SWITCH ASSEMBLY

Carl E. Richard, Enfield, and Richard H. Seager, Manchester, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,631
Int. Cl.[2] H01H *13/04*
U.S. Cl. 200—5 A **10 Claims**



1. A switch assembly, comprising:

a plurality of fixed and movable switch contacts having open and closed positions;

an array of separated, spring-biased, rigid touch-buttons respectively movably actuating the movable switch contacts to their closed positions with respect to said fixed contacts;

a smooth surface, extremely flexible and resilient, indicia-bearing cover plate, adapted to be contacted by a user, fitting over and contacting said array of touch-buttons so that flexure of a predetermined area on said cover plate operates selectively to depress one of said touch-buttons and to move a corresponding one of said movable contacts into its closed position;

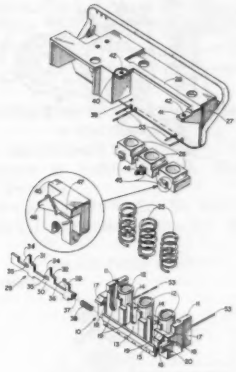
a console having a wall provided with openings, said array of touch-buttons extending respectively through said openings and slightly above said wall said cover plate bearing on said console wall.

3,908,101

PUSHBUTTON SWITCH ASSEMBLY WITH INTERLOCK STRUCTURE

Gerd Kuhfus, London, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed July 17, 1974, Ser. No. 489,174
Int. Cl.[2] H01H *9/24*
U.S. Cl. 200—5 EA **3 Claims**



1. In a pushbutton module comprising a molded body portion;

a latch bar supported in slideable relation to a face on the body portion; a plurality of pushbuttons resiliently mounted on said body portion; projections on at least two of said pushbuttons and projecting from said face on said body portion; a formation on said latch bar opposite each projection on a pushbutton;

at least one pushbutton projection and the related formation interengaging such that actuation of said pushbutton engages the pushbutton projection with the related formation to slide said latch bar from an initial position, the pushbutton formation moving past said formation to permit sliding of said latch bar back to said initial position, said formation engaging with the related pushbutton projection to latch said pushbutton in its actuated position; a further one of said pushbutton projections including a resilient member, said resilient member deflecting and moving past the related formation on said latch bar on actuation of the related pushbutton, release of the pushbutton engaging said resilient member with the related formation to slide said latch bar from the said initial position to release any latched pushbutton, said latch bar slideable to said initial position on release of said resilient member from the related formation on final release of the related pushbutton; and resilient means urging said latch bar to said initial position, the improvement comprising a channel formation formed in an upper surface of an integral projection at a lower

part of said face; integral projections at an upper part of said face, and a groove in each integral projection, the grooves in opposition to said channel formation, said latch bar slideably supported at a bottom edge in said channel formation at a top edge in said grooves, said latch bar retained in said slideable relation to said face on said body portion by said channel formation and said grooves.

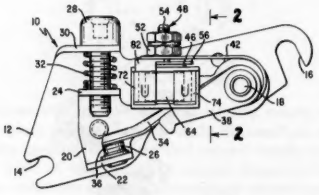
2. In a pushbutton module as claimed in claim 1 at least one abutment member on each pushbutton;
switch contacts on said body portion, said abutment members actuating said switch contacts on actuation of a related pushbutton.

3,908,102

UNITIZED BREAKER POINT AND CHIP CAPACITOR ASSEMBLY

Helmut K. Seike, Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Oct. 2, 1974, Ser. No. 510,952
Int. Cl.[2] H01H *19/00*
U.S. Cl. 200—19 A **4 Claims**



1. A unitized breaker point and capacitor assembly comprising a support plate, a breaker arm pivotally connected to said plate, a spring connected to said arm, a lug extending from said plate, a fastener connecting said spring to said lug, an insulator for electrically insulating said fastener and spring from said lug, a chip capacitor, a first tab connected to one side of said capacitor and a second tab connected to the other side of said capacitor, said first tab being disposed between said lug and insulator and said second tab being disposed adjacent said spring so that said fastener also holds said capacitor in place.

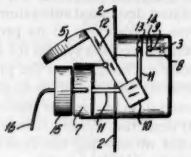
3,908,103

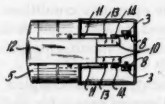
COMBINED OUTLET AND SAFETY SWITCH UNIT WITH ADAPTER

Larry L. Gyurka, 68-63 108th St., Forest Hills, N.Y. 11375

Filed May 21, 1973, Ser. No. 362,338
Int. Cl. H01h *9/20;* **Ho1r** *19/50*
U.S. Cl. 200—50 B **1 Claim**

1. A safety electrical receptacle comprising in combination: a female connector means disposed within an interior of a housing and a male connector means matable therewith and including circuitry within each of said connector means for conductance of electricity from one to the other, the female connector means including a plurality of fixed contact means each having a break in series within the circuitry thereof, and lever means disposed pivotably on said housing having a first arm extending into the interior, a plurality of movable contact means spatially positioned fixedly on the lever means to close circuit between respective opposed ones of said plurality of fixed contact means, said lever means further having a second arm extending substantially exteriorly of the housing and said second arm including a cap defining a recess facing said fe-





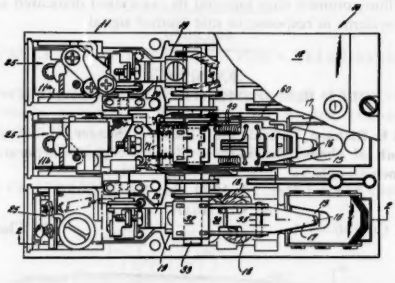
male connector means, said cap having spatial dimensions of said recess sufficient to substantially receive said male connector means when said cap is in closed state and said movable contact means are positioned to close circuit, said fixed contact means being positioned within the housing inaccessibly from said female connector means.

3,908,104

MULTI-PHASE CIRCUIT BREAKER HAVING SPRING MOUNTING FOR INTERLOCKING TIE BAR

Anthony B. Michetti, Warminster, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed May 13, 1974, Ser. No. 469,374
Int. Cl.[2] H01H *9/20*
U.S. Cl. 200—50 C **7 Claims**

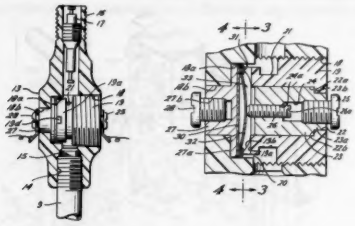


1. A multipole circuit breaker including a housing having internal partitions defining parallel compartments, one for each pole of said circuit breaker; within each of said compartments, contact means including a stationary contact and a movable contact engageable with and disengageable from said stationary contact, a movable contact arm to which said movable contact is mounted, and a carrier to which said arm is mounted, tie bar means extending across said compartments and rigidly connected to said carriers for simultaneous movement thereof as said rod is pivoted about a longitudinal axis extending therethrough; a spring powered operating mechanism connected to a first of said carriers for simultaneously operating the contact means of all poles of said circuit breaker into and out of engagement; said operating mechanism including a stationary frame having aligned spaced bearing formations; said rod being seated on said bearing formations whereby said rod is mounted for pivotal movement about said longitudinal axis; and spring clip means retaining said rod seated on said bearing formations.

3,908,105
VALVE MOUNTED PNEUMATIC TIRE PRESSURE SENSING SWITCH

Howard M. Schuler, Centerville, Ind., assignor to Tyrechek Inc., Houston, Tex.

Filed May 20, 1974, Ser. No. 471,506
Int. Cl.[2] B60C *23/02*; **H01H** *35/24*
U.S. Cl. 200—61.25 **3 Claims**



1. A tire pressure sensing switch device for mounting on the valve stem of a pneumatic tire comprising

a. a body having axially aligned, longitudinally spaced apart threaded apertures, respectively, for mounting on a tire valve stem and for receiving a valve core,

b. an orifice extending through said body transversely of and between said apertures,

c. a plug of insulating material received in one end portion of said orifice,

d. an electrical terminal mounted in said plug and insulated thereby from said body,

e. an annular shoulder at the other end of said orifice,

f. a pressure chamber between said plug and said shoulder and communicating with said apertures,

g. a thin metal, dimpling-type diaphragm traversing said chamber and secured against said shoulder,

h. a contact element for electrically connecting said terminal and the flexing crest of said diaphragm in one position of the latter, and

i. means for making constant electrical connection with said diaphragm to complete an electrical circuit through said terminal and said diaphragm crest in said one position thereof, said diaphragm crest being adapted to respond to changed pressure condition in said pressure chamber to separate said crest from said contact element and thereby break said circuit,

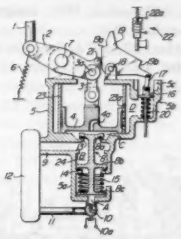
j. said body being substantially symmetrical and balanced about the axis of said aligned apertures to minimize bending stresses applied to the supporting tire valve stem in operation.

3,908,106
VALVE AND PISTON OPERATIVE MEANS FOR A CIRCUIT BREAKER

Kunio Hirasawa, and Seizo Nakano, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 13, 1973, Ser. No. 415,328
Claims priority, application Japan, Nov. 27, 1972, 47-118017
Int. Cl. H01h *35/38*
U.S. Cl. 200—82 B **7 Claims**

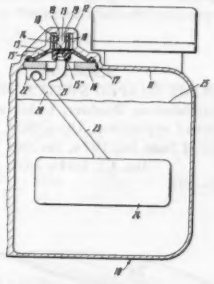
1. A circuit breaker operating device comprising an operating piston connected to one end of a pivotal lever attached to an operating rod which operates a circuit breaker, cylinder means for guiding said operating piston to move in sliding motion, circuit making means providing a force which causes said operating rod to bring the circuit breaker to a circuit making position, hook means removably engaging said pivotal lever attached to said operating rod and maintaining the circuit breaker in a circuit breaking position when instructions to break the circuit are given, said hook means being released from engagement with said pivotal lever when instructions to make the circuit are given, fluid introducing valve means having a valve seat formed on an end plate of said cylinder means and a fluid introducing valve for supplying an operating medium to said operating piston to move the same in a circuit breaking direction when instructions to break the circuit are given, and communication ports formed in a side wall of said cylinder means for discharging from said cylinder means to a lower pressure section the operating medium acting on said operating piston at least at the terminating stages of the circuit breaking operation when said operating piston is moved to open said communication ports.



3,908,107
DEVICE FOR THE CONTROL OF THE LIQUID LEVEL IN A RECEPTACLE

Ulrich Danne, and Friedrich Roters, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jan. 16, 1974, Ser. No. 433,719
Claims priority, application Germany, Jan. 31, 1973, 2304521
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 R **14 Claims**



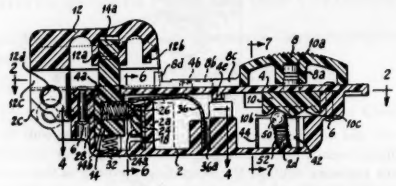
1. In a device having contact means which are part of a signal circuit and which serve for the control of the liquid level in a receptacle, for example a refill container of a hydraulic motor vehicle brake system, with the contact members being responsive to the movement of a lever which is secured to a float and which float is hingedly connected to the container, the contact means being arranged in a manner such that they are separated from the lever by means of a partition which is impervious to liquids, the improvement in which the partition comprises a flexible pressure plate against which a portion of the lever is pressed during the normal mode of operation due to the effect of the buoyant force of the float, the contact means being defined by at least one contact coupled to the surface of said pressure plate facing away from the lever and a stationary counter-contact cooperating with said one contact, further including sealing means for securing a mar-

ginal area of said pressure plate against an internal wall of the container, wherein said sealing means is a ring-shaped disc.

3,908,108
SLIDE BUTTON TOOL HANDLE SWITCH WITH INTERLOCK

Harold W. Hults, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 27, 1974, Ser. No. 455,382
Int. Cl.[2] H01H *15/18, 5/10*
U.S. Cl. 200—153 LA **8 Claims**

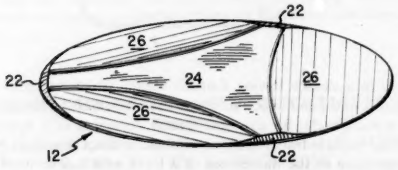


1. A double-pole tool handle switch comprising:
an insulating housing;
a slide button switch actuator mounted on said housing;
double-incline cam means secured to said slide button;
a pair of outer stationary contacts having slightly inwardly turned wings;
a pair of inner stationary contacts angularly crossing one another and arranged between said outer contacts;
said wings of each outer stationary contact and said inner stationary contacts having flat surfaces converging in opposite directions;
and a pair of movable contacts arranged for reciprocal actuation by said double-incline cam to alternately bridge said opposite converging flat surfaces of said inner and outer stationary contacts to afford reversing switching.

3,908,109
DOME SHAPED SWITCH MEMBER

Thomas J. Studebaker, Boulder, Colo., assignor to Mohawk Data Sciences Corporation, Utica, N.Y.

Filed June 14, 1974, Ser. No. 479,429
Int. Cl. H01h *1/06*
U.S. Cl. 200—275 **2 Claims**

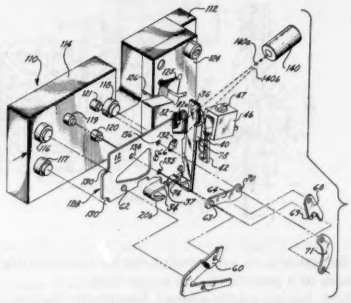


1. A dome element for use as a switch member, said dome element comprising an open circular base, a plurality of planar side walls, each of said planar side walls extending from a segment of said open circular base at equal angles thereto, an arcuate surface interconnecting said side walls and a plurality of arcuate corners angled downwardly from a tip of said arcuate surface, each of said arcuate corners interconnecting said tip of said arcuate surface with an adjacent pair of said planar side walls.

3,908,110
METHOD FOR CALIBRATING AN ELECTRIC CIRCUIT BREAKER

Eldon Bertel Heft, West Hartford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,410
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 LM **6 Claims**



1. A method of calibrating the thermal trip setting of a thermalmagnetic trip mechanism utilized in an electric circuit breaker, wherein the trip mechanism includes a bimetallic element deflectable in response to overload current through the circuit breaker, an electromagnet mounted by the bimetallic element and responsive to high magnitude fault current levels for attracting an armature, movement of the armature unlatching the circuit breaker operating mechanism to trip the circuit breaker, an armature stop for establishing the quiescent position of the armature, and a hook mounted by the metallic element and having a tip for engaging and moving the armature to trip the circuit breaker upon deflection of the bimetallic element in response to sustained overload current levels, said method comprising the steps of:
A. placing the trip mechanism in a fixture with the parts thereof assuming relative positions identical to the relative positions they would normally assume in an operative circuit breaker;
B. referencing the fixture in a predetermined fixed spatial position; and
C. machining away a portion of a particular part of the trip mechanism so as to establish a predetermined operative positional relationship between the hook and the armature when positioned against the armature stop.

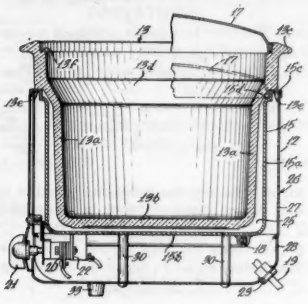
3,908,111
MULTIPLE PURPOSE COOKING APPLIANCE

Jean-Pierre Du Bois, Villa Park, and Ralph Charles Stern, LaGrange Park, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed July 3, 1974, Ser. No. 485,529
Int. Cl.[2] E27D *11/02*
U.S. Cl. 219—442 **9 Claims**

1. A multiple purpose cooking appliance comprising a primary cooking vessel formed of material having high thermal conductivity, said vessel having a bottom wall and side walls defining a mouth, an electric heating element mounted in good conducting relationship with said vessel, thermostatic control means connected in circuit with said heating element and mounted to respond to the temperature of said vessel to cyclicly energize said heating element producing a fluctuating temperature in said vessel, means for selectively controlling said thermostatic control means to establish the temperature at which said thermostatic control means fluctuates, said primary vessel with its associated heating element and thermostatic control means being adapted to perform cooking and

roasting functions at temperatures in excess of 200°F., a removable ceramic vessel having a bottom and side walls defining a mouth, said ceramic vessel having a peripheral shoulder on said side walls spaced downwardly from said mouth thereof, said shoulder being formed to engage the uppermost edge of said side walls defining said mouth of said primary cooking vessel to center said ceramic vessel with respect to said primary cooking vessel and support said vessels with their side walls and bottom walls in spaced relation forming an air space therebetween to produce a thermal lag between said



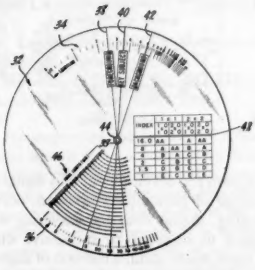
heating element and the contents of said ceramic vessel, said ceramic vessel extending above said side walls of said primary vessel facilitating removal of said ceramic vessel from said primary vessel, said appliance with said ceramic vessel supported within said primary vessel being adapted to cook foods at a low temperature on the order of 190°–200°F. for substantial periods of time without undesirable bacteria growth in the foods cooked therein, means on said primary vessel for supporting said appliance on a supporting surface, and an outer housing secured to said primary vessel and forming an enclosure for said primary vessel and said heating element.

3,908,112

CALCULATOR FOR STEREOSCOPIC PHOTOGRAPHY

Allen K. W. Lo, Atlanta, and Jerry C. Nims, Dunwoody, both of Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Filed June 19, 1974, Ser. No. 480,866
Int. Cl.² G06C 3/00
U.S. Cl. 235—61 B **8 Claims**



1. A calculator useful in determining the placements of the nearest foreground element, the key subject matter element and the farthest background element of an object field such that, upon photographing the object field along generally parallel lines of sight from a plurality N of vantage points aligned in a straight path extending generally perpendicularly to the lines of sight, the separation $X_{K\text{-}A}$ between the image of the nearest foreground element and the image of the key subject matter element, as recorded at any one vantage point, will be substantially equal to the separation X_{BK} between the image of the key subject matter element and the image of the farthest background element image, as recorded at the same vantage point, comprising:

a base member;

a first scale on the base member, the first scale being located on one side of a reference point on the base member and being calibrated to indicate distance from the lens plane of the camera used in photographing the object field to the elements of the object field, as measured in a direction generally parallel to the lines of sight;

a second scale on the base member, the second scale being located on the opposite side of the reference point in generally diametrically opposed relation to the first scale;

a foreground indicator, a key subject indicator and a background indicator, the indicators being supported on the base member for individual rotation about the reference point and being adapted to relate points on the first scale corresponding to distances a, k and b to the nearest foreground element, the key subject matter element and the farthest background element, respectively, to corresponding points on the second scale; and

the second scale being so calibrated that equal readings along the second scale between the intercepts therewith of the foreground indicator and the key subject indicator, on the one hand, and between the intercepts therewith of the key subject indicator and the background indicator, on the other, produce corresponding readings on the first scale of the distances a, k and b to the nearest foreground element, the key subject matter element and the farthest background element, respectively, which are substantially in the relationship

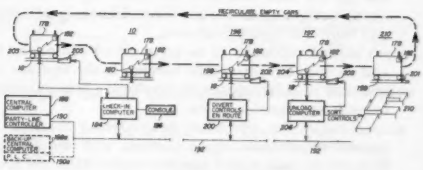
$$k/a + k/b = 2.$$

3,908,113

COMPUTER CONTROLLED OPTICAL SORT SYSTEM

Kenneth Y. Maxham, Richardson, and Richard A. Houghton, Dallas, both of Tex., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 13, 1973, Ser. No. 415,313
Int. Cl.² G06K 7/10
U.S. Cl. 235—61.7 R **17 Claims**



1. In a material handling system, the combination which comprises:

a plurality of material handling units each having a fixed identification code;

a code reader at a dispatch station generating identification data representing identification codes carried by the individual material units;

a central controller receiving the identification codes from the code reader at the dispatch station and maintaining a file of unit destination codes and corresponding unit identification codes to generate routing data therefrom and including means for tracking a material handling unit through the system by individual unit identification codes;

an array of optical code readers at change of direction locations throughout the system each generating identification data representing the unit identification code carried by a passing material unit;

a local controller responsive to the identification data from one of the array of optical code readers and receiving the routing data from said central controller to generate a unit direction signal to the change of direction location;

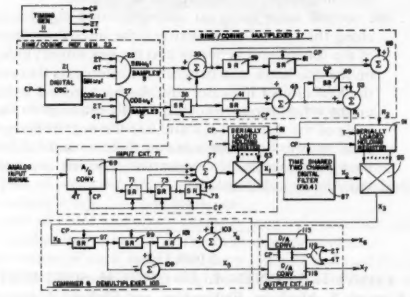
a code reader at an unload station generating identification data representing an identification code carried by a passing material unit; and

a local controller responsive to the identification data from the code reader at the unload station and receiving the routing data from said central controller to generate a direction signal to the unload station to divert a selected material handling unit to be unloaded.

3,908,114
DIGITAL HILBERT TRANSFORMATION SYSTEM

Stanley A. White, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 12, 1974, Ser. No. 496,789
Int. Cl.[2] G06F *15/34*
U.S. Cl. 235—152 **12 Claims**



1. A digital Hilbert transformation system comprising

first means for generating first and second reference signal samples in mutual phase quadrature with each other;

multiplexing means for selectively time division multiplexing the first and second reference signal samples into first and second time slots and for selectively time division multiplexing the first and second reference signal samples into third and fourth time slots;

input means responsive to an input signal and to the first and second reference signal samples in the first and second time slots for selectively developing first and second transformed signal samples;

second means for selectively heterodyning the first and second transformed signal samples with the first and second reference signal samples in the third and fourth time slots to develop a plurality of product signals; and

demultiplexing means being selectively responsive to components of the plurality of product signals for providing first and second output signals, the first output signal having first frequency components and the second output signal having second frequency components which are shifted in phase by 90° from the respective first frequency components of the first signal.

3,908,115
ADAPTIVELY TUNED DATA RECEIVER

William N. Waggener, Sarasota, Fla., assignor to Weston Instruments, Inc., Newark, N.J.

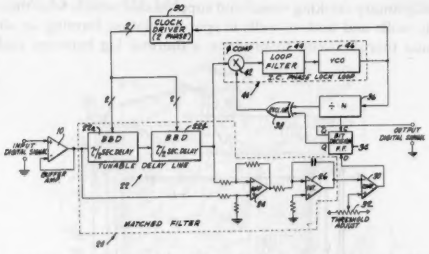
Filed Oct. 7, 1974, Ser. No. 512,990
Int. Cl.[2] H04B *1/10*
U.S. Cl. 235—152 **20 Claims**

1. A receiver comprising:

a filter having a defined transfer function and including a delay line;

means for passing an input digital signal through the filter and the delay line to derive a filter output signal resulting from transforming the input signal in accordance with said transfer function;

means for deriving a timing signal reflecting the actual rate of the input signal;



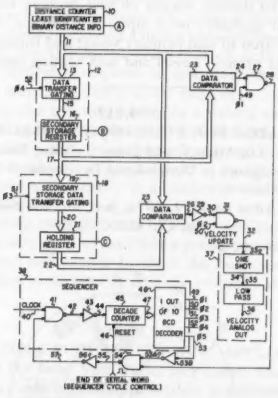
means for maintaining the delay line tuned in accordance with said timing signal and thus in accordance with the actual rate of the input signal; and

means for digitizing the filter output signal in accordance with said timing signal to derive an output digital signal.

3,908,116
DIGITAL DATA FILTER

Gary L. Bjornsen, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 16, 1974, Ser. No. 497,982
Int. Cl.[2] G06F *15/20*
U.S. Cl. 235—152 **7 Claims**



1. In a system for development of a signal indicative of the rate of change of periodically updated, normally monotonically changing, digital data by providing a rate of change update signal in response to successive changes in binary weight of input digital data; a method of digitally filtering said digital data to validate rate of change update signals in the presence of jitter in said digital data, comprising repeated operational cycles, each said operational cycle comprising the sequential steps of:

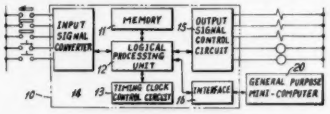
1. comparing the instant digital input data with the next previously inputted digital data and providing no rate of change update signal when these data are the same, while readying the sequence for a repeated like comparison of data in response to the next successive input of said digital data,

2. comparing the instant digital data with that which preceded said next previously inputted digital data when the comparison of Step (1) indicates unlike data being compared, and
3. developing a rate-of-change update output signal only when the comparison of Step (2) indicates unlike data being compared.

3,908,117
METHOD AND APPARATUS FOR MONITORING AND DIAGNOSING TROUBLES IN SEQUENTIAL CONTROL OPERATIONS

Katutoshi Naruse; Kazuhiko Hasegawa, both of Toyota; Kazuo Matsuno, Gifu; Toshikiko Yomogida, Chiryu, and Hideyuki Sanpe, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed Feb. 11, 1974, Ser. No. 441,068
Claims priority, application Japan, Feb. 21, 1973, 48-21037
Int. Cl.[2] G06F *11/04*
U.S. Cl. 235—153 AK **6 Claims**



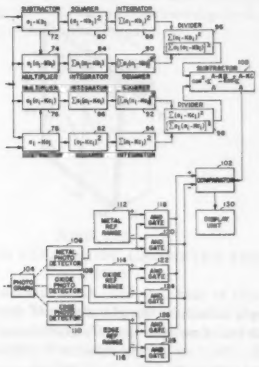
1. Method for monitoring and diagnosing troubles in sequential control operations comprising the steps of:
memorizing a predetermined machine sequence operation in a cycle memorizing means whenever each unit sequence cycle is performed, said machine sequence having at least one unit sequence cycle;
determining whether or not said predetermined machine sequence operation has completed within a predetermined time;
searching a progressing end of said unit sequence cycle when said predetermined machine sequence operation has not completed within said predetermined time, indicating an abnormality;
generating an abnormality signal indicating said progressing end;
executing diagnosis programs selected in response to said abnormality signal for diagnosing machine portions suspected to have been troubled and causes thereof.

3,908,118
CROSS CORRELATION ANOMALY DETECTION SYSTEM

Ernest Z. Micka, LaCanada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sept. 27, 1973, Ser. No. 401,225
Int. Cl. G06f *15/34*; **G01n** *21/32*
U.S. Cl. 235—181 **12 Claims**

1. In a system for inspecting the surface of a test chip by deriving reflectance signals from a reflectance beam caused by scanning the surface of said test chip with a scanning light beam, using, as criteria for such inspection, data derived from an acceptable chip or chips, said data being in the form of a plurality of calculated terms arranged in a predetermined pattern in a first matrix, a rotation matrix of said first matrix, and acceptable ranges for metal, oxide and edge regions of said chip, the improvement comprising
means for generating a plurality of first signals each representative of the product of K and a different on of said terms in said first matrix, where K is a constant selected to provide a desired inspection sensitivity,
means for generating a plurality of second signals each representative of the product of K and a different one of said terms in said rotation matrix,
means for generating a plurality threshold signals respectively representative of said acceptable ranges for metal, oxide and edge regions,
means for simultaneously and sequentially selecting each of said plurality of first signals and said second signals as each element of the surface of said test chip is scanned by said scanning beam,
means for representing the surface regions of an acceptable chip,



means for deriving from said means for representing the surface regions of an acceptable chip in synchronism with the surface scan of said test chip signals representative of the region of the surface of an acceptable chip that should be scanned at that time by said scanning light beams,
means responsive to said signals representative of the region of the surface of an acceptable chip for selecting the threshold signals for the region represented from said means for generating a plurality of threshold signals;
means responsive to said first signals, said second signals and to said reflectance signals from said chip for generating a first function signal representative of the function

$$\cos^2 \frac{(A - KB)}{A} = \frac{\Sigma(a_i - Kb_i)^2}{[\Sigma a_i(a_i - Kb_i)]^2},$$

and a second function signal representative of the function

$$\cos^2 \frac{(A - KC)}{A} = \frac{\Sigma(a_i - Kc_i)^2}{[\Sigma a_i(a_i - Kc_i)]^2},$$

where a_i represents said reflectance signals, b_i represents said first signals, c_i represents said second signals and K is said sensitivity constant,
means for subtracting the first function signal from the second function signal to produce a difference signal, and
means for comparing said difference signal with said selected threshold signals for determining whether or not said chip passes inspection.

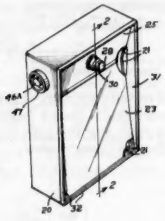
3,908,119
INSPECTION DEVICES

Nerses J. Zeytoonian, 202 Temple Rd., Waltham, Mass. 02154

Filed June 10, 1974, Ser. No. 477,646
Int. Cl.[2] F21V *33/00*
U.S. Cl. 240—4.2 **8 Claims**

1. An inspection device comprising a case dimensioned to be hand held and to be carried in pockets and handbags, the

front of said case open and including an internal shoulder defining seats inclined downwardly towards each other, a mirror secured to one seat, a panel secured to the other seat and including at least one lamp socket and a lamp of the prefocused type in said socket, the socket adjacent one end of the mirror and so disposed relative thereto that the light beam for the lamp is disposed across the mirror and defines such an



acute angle relative to the plane thereof that in the inspection in the mirror of an area directly illuminated by the lamp, the eyes of the observer are not subjected to the direct glare of the lamp, said case including a back defining with the mirror and the panel a chamber, a battery circuit within said chamber and including the socket and a lamp contact, a switch including an actuator extending through said case for manual engagement and battery contacts in the chamber and under said mirror.

3,908,120

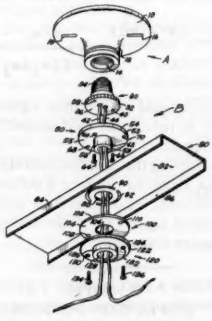
ROTATIONAL COLLAR ALIGNMENT DEVICE

Albert Alfonso Greene, Cleveland, Ohio, assignor to Preformed Line Products Co., Cleveland, Ohio

Filed June 18, 1974, Ser. No. 480,419

Int. Cl.[2] H05B *33/02*

U.S. Cl. 240—51.11 R **20 Claims**



1. A self-contained fluorescent lamp fixture adapted for installation into a conventional incandescent lamp socket comprising in combination:

a socket adaptor receivable in said socket for supporting said fluorescent fixture;

a fixture body cover in operative association with said adaptor which is adapted to receive and support a fluorescent light tube and its operative components, said fixture body including means for locating said body cover relative to said socket adaptor while permitting said body cover to be selectively rotated about the longitudinal axis of said socket adaptor in a plane generally normal thereto; and, force means for continuously exerting a biasing force against said body cover to urge said cover toward engagement with said socket adaptor to retain said cover in a desired position relative to said socket adaptor, said force means allowing forced rotational movement of said cover relative to said socket adaptor for alignment purposes.

3,908,121

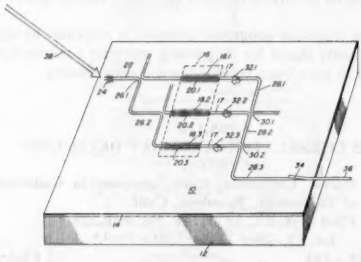
INTEGRATED OPTICAL FREQUENCY-DIVISION MULTIPLEXER

Leslie A. Riseberg, Sudbury; Harold Samelson, and Alexander Lempicki, both of Wayland, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 417,024, Nov. 19, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,417

Int. Cl.[2] H04B *9/00*

U.S. Cl. 250—199 **10 Claims**



1. An integrated optical frequency-division multiplexer for generating a plurality of individual optical signals at a like plurality of distinct wavelengths comprising

a substrate which is formed from a first rigid dielectric material having a first index of refraction and which has a planar surface thereon,

a plurality of longitudinally extended optical waveguide paths being disposed on the planar surface of the substrate, the optical waveguide paths being formed of a thin layer of a second dielectric material having a second

index of refraction which is greater than the first index of refraction, at least a portion of the length of each optical waveguide path having a dye dispersed uniformly therein which dye is capable of emitting stimulated radiation over a wide spectrum of optical wavelengths,

means for defining a resonator in that portion of each optical waveguide path wherein the dye is dispersed uniformly, the resonator being resonant and providing an output at a particular wavelength within the wide spectrum, each of the plurality of particular wavelengths being different,

means for pumping the dye within each of the resonators with suitable energy to excite the dye molecules above their threshold emission level,

means for individually modulating each of the plurality of outputs, and

means for combining the plurality of outputs to form a frequency-division multiplexed, individually modulated output signal.

3,908,122

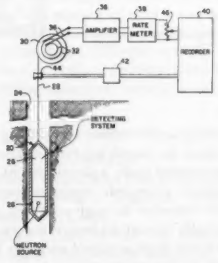
METHOD FOR DETECTING ENTRY OF A LOW HYDROGEN CONTENT GAS INTO BOREHOLE FORMATIONS

Kenneth D. Hartsell, Big Lake, Tex., assignor to The Western Company of North America, Fort Worth, Tex.

Filed July 26, 1973, Ser. No. 382,857

Int. Cl. G01v *5/00*

U.S. Cl. 250—259 **6 Claims**



1. In a secondary recovery system of the type in which gas is injected into the formation and forces oil into one or more adjacent producing wells, the method of detecting the entry of the injected gas into one of the producing wells which comprises the steps of, injecting into the formations at a point removed from one of the producing wells a gas having less hydrogen content than the hydrocarbon products native to the formations adjacent said one of the producing wells, obtaining an initial neutron log of said producing well prior to the entry of said injected gas into said producing well, obtaining a second neutron log of said producing well after the entry of said injected gas into said producing well, and comparing said initial neutron log and said second neutron log to determine the point of entry of said injected gas.

3,908,123

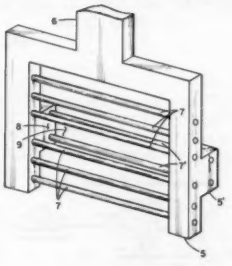
EXTRACTION ELECTRODE GEOMETRY FOR A CALUTRON

Allen M. Veach, and William A. Bell, Jr., both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 16, 1974, Ser. No. 461,472

Int. Cl.[2] H01J *39/34*

U.S. Cl. 250—298 **2 Claims**



1. In a calutron system including an ion source chamber provided with a side chamber cover having a narrow elongated ion exit slit, said chamber adapted to receive a vaporized charge material therein, means for producing an arc discharge which is associated with and passes through said chamber by means of arc defining slots for ionizing the charge material within said chamber, a magnetic field for effecting charge separation of the ions as they pass from said ion source exit slit, the improvement comprising an improved extraction electrode geometry including a negatively biased graphite accelerating electrode mounted adjacent to and parallel with said ion source chamber cover, said negative electrode being in the form of a first bottom-opened picture frame provided with a first plurality of spaced-apart metal rods mounted in parallel relation in the vertical legs of said frame, said frame being provided with a pair of flanges extending rearwardly from about the center of said frame's vertical legs, a pair of spaced-apart metal rods mounted between and to said flanges, said pair of rods defining an ion exit slit in alignment with said ion source cover exit slit and in alignment with a slit formed

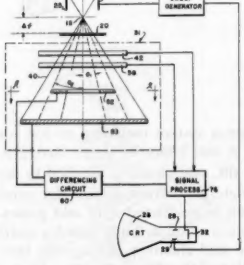
between two of said first plurality of metal rods; and a graphite ground electrode mounted adjacent to and parallel with said negative electrode, said ground electrode being in the form of a second bottom-opened picture frame provided with a second plurality of spaced-apart metal rods mounted in parallel relation in the vertical legs of said second frame with two of said second plurality of rods defining an ion exit slit in alignment with all of said previously mentioned exit slits, whereby during operation of said calutron all of said metal rods except those used for providing said ion exit slits are utilized to establish equipotential surfaces over the rest of the front of said ion source for effecting a substantial reduction of un-ionized charge materials thereabout, thereby providing an increased ion output from said ion source and more stable calutron operation.

3,908,124

PHASE CONTRAST IN HIGH RESOLUTION ELECTRON MICROSCOPY

Harald H. Rose, Darmstadt, Germany, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 1, 1974, Ser. No. 484,740
Int. Cl.[2] H01J *37/26;* **G01N** *23/00*
U.S. Cl. 250—311 **8 Claims**



1. In a scanning transmission electron microscope operating in a condition of defocus such that there are within the cone of illumination regions alternately of the quality of higher electron density and of lower electron density, the alternate density regions being caused by the interference within the cone of illumination of electrons elastically scattered by the specimen with electrons unscattered by the specimen, a device for developing a phase contrast signal, comprising:

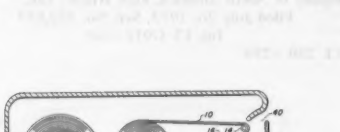
a first detector positioned within the cone of illumination, and being of such radial configuration with respect to the optical axis that electrons within all alternate regions of the cone of illumination having one of the qualities of density are incident thereon, said first detector being responsive to electrons incident thereon to develop a first output signal representative of the intensity thereof, a second detector positioned within the cone of illumination and being of such configuration that electrons within the cone of illumination not incident upon said first detector are incident upon said second detector, said second detector being responsive to electrons incident thereon to develop a second output signal representative of the intensity thereof, a differencing circuit coupled to said first and second detectors and responsive to said first and second output signals therefrom to subtract said first output signal from said second output signal and to develop a phase contrast signal which is the subtraction of said first output signal from said second output signal, and utilization means coupled to said differencing circuit for utilizing said phase contrast signal.

3,908,125

REVERSE PATH IMAGING AND TRANSFIXING COPYING MACHINE

Roger H. Eichorn, deceased, late of Webster, N.Y., and Lincoln First Bank of Rochester, executor, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1973, Ser. No. 428,956
Int. Cl.[2] B41M *5/00*
U.S. Cl. 250—316 **15 Claims**

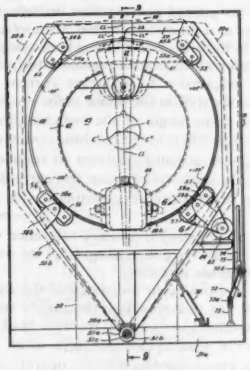


1. A thermographic copier comprising the combination of a radiant source for supplying radiant energy to a first station via a predetermined path, a development station spaced from said first station, reversible transport means for advancing a heat sensitive member through said first station in one direction to thermally impart an image thereto and for continuing movement of said heat sensitive member in said one direction through said development station to develop said image and for then moving said heat sensitive member back in the opposite direction through said first station to produce a substantially permanent copy of said image, a copy supply tray, means for moving a copy member out of said tray and into contact with said heat sensitive member at a location between said development station and said first station when said heat sensitive member is moving in said opposite direction, and means for selectively energizing said radiant source in preparation for the passage of said heat sensitive member through said first station is said one and said opposite directions.

3,908,126
X-RAY APPARATUS FOR PROVIDING PANORAMIC RADIOGRAPHIC PROJECTIONS

Donald C. Hudson; Charles R. Morris; Horst G. Fleck, and Karl A. Senghaas, all of San Antonio, Tex., assignors to Pennwalt Corporation, S.S. White Dental Products Division, Philadelphia, Pa.

Filed Jan. 2, 1974, Ser. No. 429,482
Int. Cl. G03b *41/16*
U.S. Cl. 250—320 **37 Claims**



1. An *x*-ray apparatus for providing substantially continuous panoramic radiographic projections of an object on an *x*-ray film, comprising, in combination:

a fixed frame;

an *x*-ray source mounted for rotation with respect to said frame;

a film holder including an *x*-ray slit and means for supporting an *x*-ray film for movement past said slit, said film holder mounted for rotation with said *x*-ray source to permit panoramic radiographic projections to be taken of an object placed between said *x*-ray source and film holder;

means for rotating said *x*-ray source and film holder about said object;

means for shifting the center of rotation of said *x*-ray source and film holder with respect to said object and in substantially the plane of rotation of said *x*-ray source and film holder to permit portions of a single panoramic radiograph to be taken from different centers of rotation for providing a focal trough of predetermined shape; and

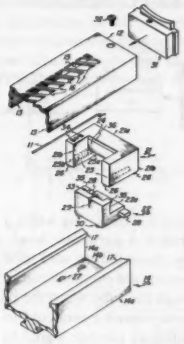
means for providing selective variations in the amount of said shift.

3,908,127
CORONA GENERATING DEVICES

Peter Frederick Clark, Ware, England, assignor to Xerox Corporation, Stamford, Conn.

Filed June 11, 1974, Ser. No. 478,208
Claims priority, application United Kingdom, Dec. 21, 1973, 59527/73
Int. Cl.[2] H01T *19/04*
U.S. Cl. 250—325 **6 Claims**

1. A corona generating device, including a coronode connected between mountings, at least one of which comprises a fixed member and a movable member, to which the associated end of the coronode is attached, said members interacting through compressible resilient means which act to urge the movable member in the direction of the adjacent end of the device, said fixed member being generally channel-shaped in cross-section, said channel-shaped cross-section being defined by side walls extending from a common bridging wall in a direction away from said adjacent end, the resilient means

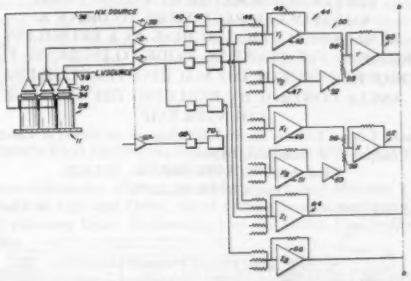


being arranged in recesses in the side walls of said fixed member and said movable member having lateral lugs which engage the resilient means.

3,908,128
RADIATION SENSING DEVICE

Joseph B. Richey, Shaker Heights, Ohio, assignor to Ohio Nuclear, Inc., Solon, Ohio

Filed Sept. 12, 1973, Ser. No. 396,494
Int. Cl. G01t *1/20*
U.S. Cl. 250—366 **10 Claims**



1. A radiation sensing device comprising:

means for forming a visible response from radiation;

means for converting the visible response from radiation to electrical impulses, the means for forming being substantially adjacent to the means for converting thereby causing distortion of the relation of the electrical impulses to the location of the radiation; and

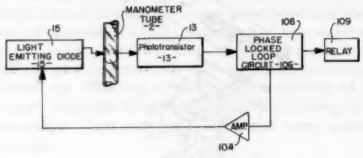
means for operating on the electrical impulses to create a signal which gives an indication of the relative location of the radiation including;

means for correcting distortion including a non-linear response device which gives an output which is not directly proportional to the input signal, the means for correcting further including a non-linear device having an input and an output and a varying biasing means operatively connected to the non-linear device to vary the output thereof.

3,908,129
MANOMETER LEVEL DETECTOR

Robert F. Akers, Fountain Valley, Calif., assignor to Datagage Systems, Inc., Fountain Valley, Calif.

Filed Apr. 8, 1974, Ser. No. 458,867
Int. Cl.[2] G01N *21/24*
U.S. Cl. 250—577 **4 Claims**

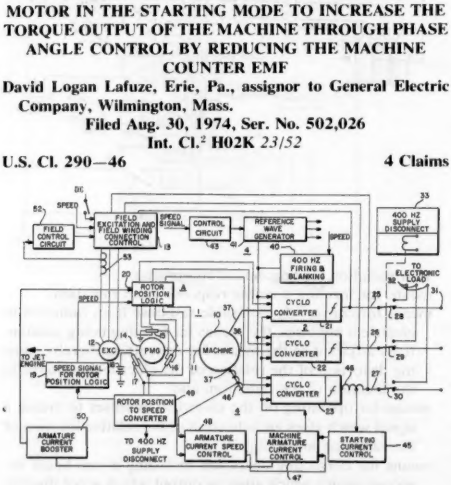


1. An optical sensor for detecting when a liquid in a transparent tube drops below a particular level, said sensor comprising: a head to be mounted on said tube at the particular level; a light source mounted on said head in position to direct a beam of light through the tube when the head is mounted on the tube; an electronic circuit connected to said light source to introduce an oscillatory electric signal to said light source to cause said light source to emit a pulsating light beam; a light sensitive detector mounted on said head at a predetermined angle with respect to said light source in position to receive the pulsating light beam from said light source as refracted by the wall of the tube when the liquid in the tube drops below the predetermined level, said light sensitive detector responding to the pulsating light beam to generate a corresponding oscillatory electric signal and to introduce said last-named signal to said electronic circuit to establish a locked condition in said electronic circuit as long as the intensity of the pulsating light beam received by said light sensitive detector exceeds a predetermined threshold; and electrically energized means connected to said electronic circuit to be activated only when the aforesaid locked condition in said circuit is established.

3,908,130
STARTER-GENERATOR UTILIZING PHASE CONTROLLED RECTIFIERS TO DRIVE A DYNAMOELECTRIC MACHINE AS A BRUSHLESS MOTOR IN THE STARTING MODE TO INCREASE THE TORQUE OUTPUT OF THE MACHINE THROUGH PHASE ANGLE CONTROL BY REDUCING THE MACHINE COUNTER EMF

David Logan Lafuze, Erie, Pa., assignor to General Electric Company, Wilmington, Mass.

Filed Aug. 30, 1974, Ser. No. 502,026
Int. Cl.[2] H02K *23/52*
U.S. Cl. 290—46 **4 Claims**



1. In a starter-generator system the combination of:

a. A dynamoelectric machine for operation both as a brushless DC motor and as a constant frequency AC generator,

b. Cycloconverter means coupled to said machine for selectively supply current to the machine armature windings during motoring operation and for converting the frequency of the output from the machine to provide a constant frequency output from the machine during generator operation, said cycloconverter means including banks of oppositely poled, phase controlled, gated switching devices,

c. Means to operate said dynamoelectric machine as a brushless DC motor including:

1. a source of fixed frequency alternating supply voltage coupled to said banks of switching devices,

2. means for sensing the rotor position of said dynamoelectric machine and for producing enabling signals for gating selected ones for said switching devices in sequence to permit current flow in selected armature windings as a function of rotor position so that current flow is in the armature winding having high flux associated therewith to produce positive torque,

3. means responsive to armature current level in said machine for shiftint the phase of the enabling signals to vary the firing angle of the switching devices over a speed range wherein the machine counter EMF is high and reduces armature current to reduce the counter EMF sufficiently to increase the current to allow the machine to produce accelerating torque in said speed range.

d. A source of constant frequency reference waves,

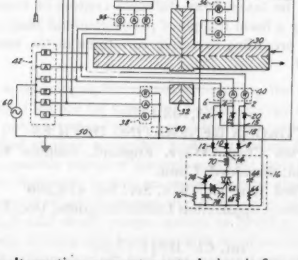
e. means for converting the system from the motoring to the generating mode including,

1. means responsive to the speed of the dynamoelectric machine for disconnecting the supply voltage and the rotor position gating means from the banks of switching devices of said cycloconverters when the machine reaches a speed at which it is to operate as a generator, and means responsive to the speed of the dynamoelectric machine for coupling said source of constant frequency reference waves to said switching devices to convert the machine voltage of varying frequency to a constant frequency output in the generating mode.

3,908,131
CONTROL CIRCUIT HAVING LOAD AND POWER SOURCE ISOLATION

William J. E. Anton, Newport, Minn.; John E. Collins, North Hudson, Wis., and Peter A. Lind, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 289,444, Sept. 15, 1972, Pat. No. 3,800,185. This application Jan. 4, 1974, Ser. No. 430,792
Int. Cl.[2] G08G *1/095*
U.S. Cl. 307—12 **3 Claims**



1. An alternating current control circuit for connection in series with each of a plurality of loads and a common circuit neutral to control current flow to the plurality of loads comprising:

a circuit portion including a gated semiconductor switching device and a gating circuit having a variable impedance connected to gate said switching device for controlling curre nt flow through said circuit portion; and

a plurality of sets of two, like poled, series connected unidirectional devices, one set for each load, said sets poled in the same direction and connected in parallel across said circuit portion, each of said sets providing a separate load connecting point for the control circuit, said connecting point being intermediate the two unidirectional devices of the set.

3,908,132

ARRANGEMENT FOR SYNCHRONIZING STATIC THYRISTOR CONVERTERS FOR SUPPLYING THREE PHASE MOTORS

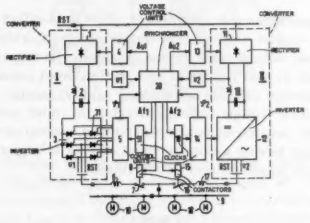
Dietrich Krampe, Erlangen, and Wilhelm Linden, Erlangen-Buchenbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 24, 1974, Ser. No. 436,071

Claims priority, application Germany, Jan. 29, 1973, 2304229

Int. Cl.[2] H02J *3/00*

U.S. Cl. 307—87 **7 Claims**



1. Apparatus for synchronizing a pair of free-running, load controlled, static thyristor converters including control means for generating firing signals at a predetermined frequency for controlling the output voltage frequency of said converters, and in which the phase, frequency and voltage outputs of said converters are compared and adjusted until said phase, frequency and voltage are equal, said apparatus generating a command signal for shifting the load from one of said converters to the other, said apparatus comprising:

first means, coupled to said converters, for comparing the time of firing of two corresponding firing signals in said pair of converters and generating a first output signal upon the simultaneous occurrence of said two firing signals;

second means, coupled to said converters, for comparing the converter output voltages and generating a second output signal when said output voltages are equal;

third means, coupled to said first means, for automatically shifting the phase of one of said converters with respect to the other in the absence of the generation of said first output signal; and

fourth means, coupled to said first and second means, and responsive to said first and second output signals, for generating said command signal in response to the generation of both said first and second output signals and thereby shifting the load from one of said converters to the other.

3,908,133

HIGH-LOW LEVEL CONTROL CIRCUIT

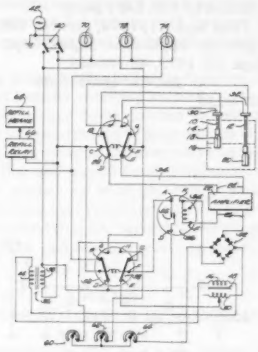
Nelson Hartley, Towson, Md., assignor to Hartley Controls Corporation, Neenah, Wis.

Filed May 23, 1974, Ser. No. 472,790

Int. Cl.[2] H01H *36/00*

U.S. Cl. 307—118 **8 Claims**

1. A level responsive circuit for initiating a predetermined action in response to the level of material in a container, comprising a first probe located at a first predetermined level in said container, a second probe located at a second predetermined level in said container, an amplifier circuit having signal input terminals, switch means coupled between said first and second probes and said signal input terminals and operable to couple said first probe to said signal input terminals in a first position of the switch means and to couple said second probe to said signal input terminals in a second position of the switch means, a current responsive device coupled to said amplifier circuit, said current responsive device having two different states and being switchable to its first state in response to a first level of current flow therethrough and being switchable



to its second state in response to a second level of current flow therethrough, means coupled to said current responsive device for initiating said predetermined action in response to one state thereof and for terminating the action in response to the other state thereof, and means coupled between said current responsive device and said switch means for switching said switch means to its first state in response to the first state of said current responsive device and for switching said switch means to its second state in response to the second state of said current responsive device, thereby permitting one amplifier circuit and one current responsive device to be used for the both probes.

3,908,134

OPEN-END SPINNING MACHINES PROVIDED WITH TIMING DEVICES

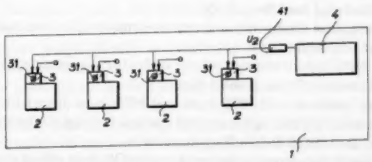
Karel Mikulecky, Chocen; Stanislav Esner, and Miloslav Tyl, both of Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Mar. 7, 1974, Ser. No. 448,983

Claims priority, application Czechoslovakia, Apr. 20, 1973, 2853-73

Int. Cl. H02j

U.S. Cl. 307—154 **3 Claims**



1. In an open-end spinning machine with spinning units each provided with a timing device for timing the spinning units in case of removal of temporary conditions, said timing device

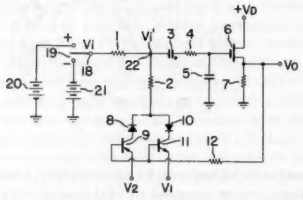
comprising a timé control circuit including correcting regulating elements for the individual adjustment of the time constants of each spinning unit, and a common regulating element preconnected to the timing devices of the individual spinning units for the simultaneous adjustment of the time constants of all the spinning units according to the currently required spinning conditions of the spinning machine.

3,908,135

DEVICE FOR VARYING OUTPUT VOLTAGE

Shunji Minami, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 11, 1974, Ser. No. 505,007
Claims priority, application Japan, Sept. 20, 1973, 48-110427; Sept. 20, 1973, 48-106609
Int. Cl.[2] H03K *5/08*
U.S. Cl. 307—237 **5 Claims**



1. A device for varying output voltage within a limited range comprising

a. a single-pole, double-throw, center-off switch,

b. a first resistor, a neon bulb having one terminal connected to an armature of said switch through said first resistor,

c. an input resistor, a MOS field-effect transistor having a gate connected through said input resistor to the other terminal of said neon bulb,

d. a non-polarized capacitor electrically connected between the gate of said MOS field-effect transistor and the ground,

e. an output resistor electrically connected between the source of said MOS field-effect transistor and the ground,

f. a first diode cathode is connected to the junction of said neon bulb and said input resistor through a first control resistor to interrupt the input signal to be transmitted to said first diode,

g. a PNP type transistor whose collector is connected to the anode of said first diode,

h. a second diode whose anode is connected to the cathode of said first diode,

i. a NPN type transistor whose collector is connected to the cathode of said second diode, and

j. the bases of said PNP type and NPN type transistors are connected through a second control resistor to the source of said MOS field-effect transistor,

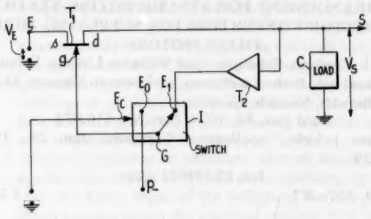
whereby the output voltage of said MOS field-effect transistor is derived from the source of said MOS field-effect transistor while the control voltages for limiting the output voltage are applied to the emitters of the PNP type transistor and the NPN type transistor respectively.

3,908,136

ANALOGUE GATES

Serge Desperques-Volmier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 2, 1974, Ser. No. 466,471
Claims priority, application France, May 8, 1973, 73.16511
Int. Cl.[2] H03K *17/60*
U.S. Cl. 307—251 **6 Claims**



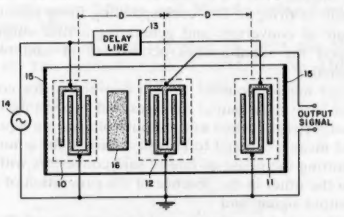
1. An analogue gate comprising a first field-effect transistor, having a source receiving the input voltage, a drain supplying the output voltage and a gate, a switch, having one output connected to said transistor gate, a first input connected to a fixed potential capable of blocking said transistor, and a second input; a voltage follower, having an input connected to said drain, an output connected to said second switch input; said switch having a control input, for switching at will, said two switch inputs to said switch output.

3,908,137

APPARATUS AND METHOD FOR TRIPLE TRANSIT SIGNAL CANCELLATION IN AN ACOUSTICAL SURFACE WAVE DEVICE

Bill J. Hunsinger; Frederick Y. Cho, both of Fort Wayne, Ind., and Brian B. Fugit, Tempe, Ariz., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Dec. 26, 1973, Ser. No. 420,038
Int. Cl.[2] H01L *41/08;* **H03H** *7/30*
U.S. Cl. 310—8.1 **17 Claims**



1. Apparatus for processing electrical signals comprising:

first delay means for delaying input electrical signals by a preselected period of time; and an acoustic surface wave device including, an acoustic-wave propagating medium, a first electroacoustic transducer coupled to said medium; a second electroacoustic transducer coupled to said medium; a third electroacoustic transducer coupled to said medium; said third transducer generating output electrical signals in response to interacting acoustic surface waves; said second electroacoustic transducer coupled to said delay means, said second transducer launching surface waves in response to said delayed input signals for interaction with said third transducer, wherein a portion of launched surface waves from said first transducer and said second transducer interact to generate undesired electrical signals; and a second delay means for delaying

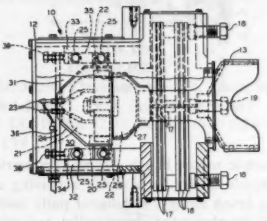
launched surface waves for substantially the same period as the first delay means, the second delay means being positioned to delay launched surface waves between the first electroacoustic transducer and the third electroacoustic transducer.

3,908,138

STATOR CORE AND ARMATURE CORE FOR A VIBRATING MOTOR

Ming K. Shieh, Westerville, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 8, 1974, Ser. No. 458,573
Int. Cl.[2] H02K 33/00
U.S. Cl. 310—29 9 Claims



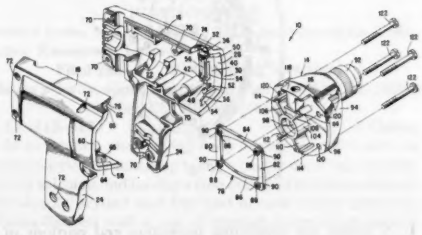
1. In a vibrating motor comprising a stator which can be alternately magnetized and demagnetized and an armature connected to the stator by spring means and disposed opposite the stator such that it is attracted toward the magnetized stator and released by the demagnetized stator to produce vibratory movement of the armature relative to the stator, the improvement wherein the stator includes a core having two magnetic poles and comprised of a plurality of concentric layers of magnetically permeable material extending in a generally horseshoe configuration from pole to pole, and wherein the armature includes a core comprised of a plurality of concentric layers of magnetically permeable material, the layers of said armature core corresponding generally to the layers of said stator core and each extending from end to end of said armature core, the ends of said armature core being disposed in spaced relationship opposite the poles of said stator.

3,908,139

PORTABLE POWER TOOLS

Avery A. Duncan, Jr., Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,879
Int. Cl.[2] H02K 7/14
U.S. Cl. 310—50 8 Claims



1. In combination in a portable power tool:

a. a power unit housing comprising first and second housing segments;

b. means for securing said housing segments together;

c. each of said housing segments including an interior surface;

d. tool head means extending from said housing segments;

e. said tool head means being detachable from said housing segments and including a contact surface for bearing against said housing segments;

f. clamping means for detachably clamping said tool head means to said housing segments;

g. said clamping means comprising a detachable fastener receiving member removably disposed in said housing segments;

h. said retaining means formed in each of said housing segments including an elongated slot formed on the interior surface thereof for holding said fastener receiving member in a predetermined fixed position in said housing segments;

i. said clamping means further including fastening means for engaging said fastener receiving member, and

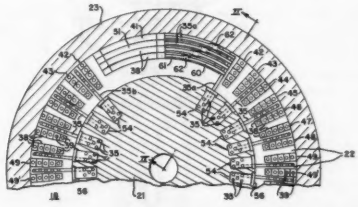
j. said fastening means being located in and extending through said tool head means to progressively engage said fastener receiving member and draw said tool head means toward said first and second housing segments to permit said contact surface to bearingly engage said housing segments whereby said fastening means clamp said tool head means to said first and second housing segments by engagement with said fastener receiving member.

3,908,140

LIQUID-COOLED ROTOR FOR DYNAMOELECTRIC MACHINES

Frank P. Fidei, Pittsburgh; Sui-chun Ying, Monroeville, and Warren W. Jones, Bullskin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1974, Ser. No. 479,386
Int. Cl.[2] H02K 9/00
U.S. Cl. 310—54 7 Claims



1. A rotor member for a dynamoelectric machine comprising:

a body portion and shaft portions connected thereto,

a winding comprising a plurality of concentrically-disposed multi-turn coils, each coil having a plurality of conductors having longitudinal portions lying in slots in said body portion and extending beyond the body portion and circumferential portions joining the ends of said longitudinal portions, said longitudinal portions being spaced apart circumferentially and defining longitudinal spaces therebetween and said circumferential portions being spaced apart longitudinally and defining circumferential spaces therebetween,

said conductors having passages for flow of coolant liquid,

a plurality of slots in said shaft portion extending longitudinally and terminating adjacent said body portion,

a plurality of coolant tubes disposed in said shaft slots and extending under said circumferential portions of said coil, said coolant tubes extending in said slots substantially to the ends thereof,

said coolant tubes extending generally radially from said shaft slots adjacent the end of said rotor body portion into

said longitudinal spaces between said longitudinal portions of said conductors,

said coolant tubes then extending longitudinally through said longitudinal spaces between said longitudinal portions of said conductors and circumferentially in said circumferential spaces between said circumferential portions of said conductors,

said coolant tubes being connected to said circumferential portions of at least some of said conductors adjacent the centers thereof to communicate with said passages therein,

said coolant tubes extending through each of said longitudinal and circumferential spaces being in vertically-spaced relation in positions generally corresponding to the conductors to which they are connected, and,

means for supplying coolant liquid to said tubes to flow through said tubes and passages.

3,908,141

EDDY CURRENT RETARDER

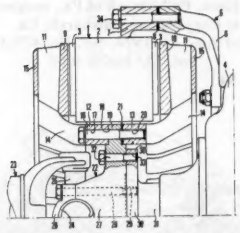
Daniel Claude Lemonnier, Paris, France, assignor to Labavia S.G.E., Paris, France

Filed Oct. 15, 1974, Ser. No. 514,786

Claims priority, application France, Oct. 15, 1973, 73.36746

Int. Cl.[2] H02K *49/04*

U.S. Cl. 310—93 **9 Claims**



1. An eddy current retarder assembly comprising:

a motor vehicle transmission casing;

a shaft end emerging from said casing;

a vehicle transmission universal joint coupled to said shaft end;

said universal joint comprising two jaws and a a spider having opposed trunnions;

a fixing flange on one of said jaws of said universal joint;

a fixing plate associated with said shaft end and connected to said one jaw;

a field stator;

means provided on said stator for fixing said stator to said casing;

a rotor comprising at least one annular armature of ferromagnetic material situated on one side of said stator; and an annular hub on said stator secured to said fixing plate; said assembly being characterised by:

said one jaw comprising a first part having said fixing flange and a second part which at least partly forms two bearings for said opposed trunnions of said spider;

said fixing plate and said first part of said one jaw being made in one piece; and

said second part of said one jaw being secured against said first part of said one jaw by locking bolts.

3,908,142

ELECTRIC MOTOR BRUSH ASSEMBLY

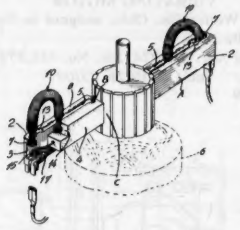
Paul Emile Gaudry, Laval des Rapides, Canada, assignor to Consolidated Foods Corporation, Old Greenwich, Conn.

Division of Ser. No. 79,511, Oct. 9, 1970, Pat. No. 3,666,258.

This application Nov. 8, 1971, Ser. No. 196,847

Int. Cl. H02k *13/00*

U.S. Cl. 310—242 **6 Claims**



1. An electric motor brush assembly comprising a hollow elongated brush holder for slidably receiving and guiding a commutator brush along a rectilinear path, said holder being formed with an elongated slot parallel and adjacent to said path, the end of said slot remote from the commutator being closed, said slot having a widened portion near the closed end thereof, a symmetrical coil spring having a main body portion and, at each end thereof, a reduced diameter neck portion followed by an enlarged knob-shaped terminal portion, said knob-shaped portion being of less diameter than said widened portion of said slot but of greater diameter than the remaining portion thereof, adjacent turns of all portions of said spring being substantially in contact with each other when said spring is in relaxed condition, the reduced diameter neck portion of said spring extending through and slidably retained in said slot, the main body portion of said spring being disposed outside said holder in flexually stressed condition, and the knob-shaped terminal portions being disposed within said holder and respectively bearing against the closed end of said slot and said brush.

3,908,143

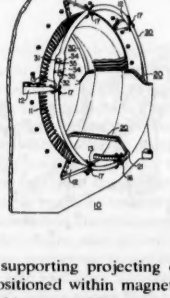
ADJUSTABLE STATOR RING

Bernard R. Buncher, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1974, Ser. No. 482,192

Int. Cl.[2] H02K *3/46*

U.S. Cl. 310—260 **8 Claims**



1. A device for supporting projecting end portions of a plurality of coils positioned within magnetic core slots of a dynamoelectric machine comprising:

a plurality of supporting members having notched portions, said supporting members being arranged about said mag-

netic core slots and being rigidly attached to said dynamoelectric machine; and

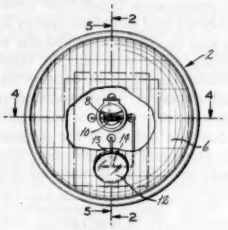
an annular member having a predetermined circumference and being adapted to circumscribe said projecting coil end portions, said annular member being disposed in said notched portions, said annular member having integral means for adjusting said circumference while said annular member is disposed within said supporting members, said integral means for adjusting said circumference comprising first and second coextensive elongated segments which are disposed parallel one to another, each elongated segment being severable to allow circumferential displacement of said first elongated segment with respect to said second elongated segment, and means for mechanical connection of said first elongated segment with said second elongated segment.

3,908,144

HEADLIGHT

Eugene D. Rudd, 3929a Cleveland Ave., St. Louis, Mo. 63110

Filed June 3, 1974, Ser. No. 475,405
Int. Cl.² H01K *1/30*; **B60Q** *1/04*, *1/26*
U.S. Cl. 313—114 **5 Claims**



1. A sealed beam headlight having a first parabolic reflector with a horizontally extending axis, a first light source carried by said reflector and located adjacent said axis, and a lens integrally formed with said reflector, characterized by a second light source carried by a second parabolic reflector located away from the axis of said first reflector, and a colored insert in said lens located away from the axis of said first reflector, said second light source being located in the axis of said second reflector adjacent to the insert in the lens, said second parabolic reflector substantially surrounding said second light source and shielding said colored insert from light emitted by said first light source, said second light source being connected to its own power terminal for connection in a circuit other than a circuit in which said first light source is connected.

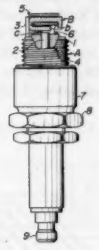
3,908,145

IGNITION PLUG

Tunesuke Kubo, No. 20, Idogaya Naka cho, Minami-ku, Yokohama, Kanagawa, Japan

Filed Jan. 31, 1974, Ser. No. 438,190
Claims priority, application Japan, Feb. 13, 1973, 48-18201
Int. Cl.² H01T *13/46*
U.S. Cl. 313—123 **9 Claims**

1. In an ignition plug, a plug body having a central axis, an insulator carried by said plug body, a center electrode extending along said axis and having a free end, said insulator extending outwardly beyond said free end of said center electrode and being formed with a pair of through-holes which extend transversely with respect to said axis with one of said through-holes being situated next to and receiving said free end of said center electrode while the other of said through-holes is situated at the side of said one through-hole opposite from said free end of said center electrode, an intermediate wire of generally C-shaped configuration having a pair of legs respectively situated in said through-holes and at one side of said through-holes an intermediate elongated portion extending parallel to said axis and interconnecting said legs, said leg which is in said one through-hole extending across but being spaced from said free end of said center electrode to define a



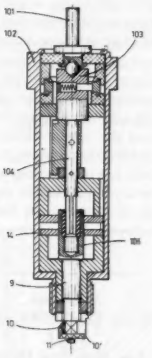
first spark gap therewith, and a grounded electrode connected with said plug body and having a portion extending parallel to but spaced from said intermediate portion of said wire for defining a second spark gap therewith and for providing in said second spark gap a spark discharge having the shape of a band the breadth of which equals the distance between said grounded electrode and intermediate portion of said wire.

3,908,146

BREAK IGNITION PLUG AND IGNITION DEVICE

Max Pasbrig, Orselina, Switzerland, assignor to Lacrex Brevetti S.A., Minusio, Switzerland

Continuation of Ser. No. 314,014, Dec. 11, 1972, abandoned.
This application Aug. 19, 1974, Ser. No. 498,736
Int. Cl.² H01T *13/24*
U.S. Cl. 313—125 **3 Claims**



1. A break ignition plug and ignition device, especially for piston motors, with a current supply means, comprising a movable electrode means cooperating with a stationary electrode means, armature means, connection means, a magnetic coil acting upon said armature means via said connection means to actuate said movable electrode means, an ignition pulse passing through the magnetic coil and a short-circuit path between the movable electrode means and the stationary electrode means, the magnetic field building-up in the magnetic coil causing the breaking of the short-circuit path with corresponding spark formation, the improvement comprising at least one of said electrode means being mounted to be rotatable through an angle of 360° with respect to the longitudinal axis of the ignition plug, and at least one of said electrode means possessing a substantially saw-toothed shaped

construction cooperating with the other electrode means for the formation of ignition sparks.

3,908,147

GLOW-DISCHARGE DISPLAY DEVICE INCLUDING CATHODE ELEMENTS OF FINELY DIVIDED CARBON

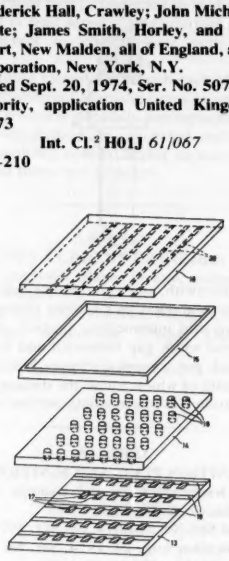
Raymond Frederick Hall, Crawley; John Michael Stuart Schofield, Reigate; James Smith, Horley, and Jeffrey Charles Merrell Short, New Malden, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,722

Claims priority, application United Kingdom, Sept. 28, 1973, 45522/73

Int. Cl.[2] H01J *61/067*

U.S. Cl. 313—210 **7 Claims**



1. An electrical glow-discharge display device comprising a hermetically sealed envelope containing an ionizable medium and a transparent window portion, an array of glow-discharge cathode elements and an anode element adjacent each cathode element for co-operating therewith to define an array of direct current glow-discharge paths through the ionizable medium contained in said device, means interconnecting the cathode elements and the anode elements, respectively into groups forming an addressing system for said paths, each of said cathode elements having a substrate portion and a current-limiting surface layer portion in contact with the ionizable medium and physically separate from each other surface portion, said surface layer portion comprising carbon in finely divided form.

3,908,148

ELECTRO-OPTICAL TRANSDUCER AND STORAGE TUBE

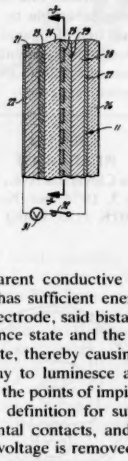
Norman B. Lehrer, Los Altos, and David R. Peterson, Mountain View, both of Calif., assignors to Watkins-Johnson Company, Palo Alto and Signetics Corporation, Sunnyvale, both of, Calif.

Division of Ser. No. 428,797, Dec. 27, 1973, which is a continuation-in-part of Ser. No. 188,099, Oct. 12, 1971. This application Nov. 18, 1974, Ser. No. 524,775

Int. Cl.[2] H01J *29/10, 31/08*

U.S. Cl. 313—398 **10 Claims**

1. An electro-optical transducer responsive to a projected energy beam comprising a bistable switch having in layered sequence a semiconductor layer, a dielectric barrier layer, and a tunnelling layer; elemental contacts on said bistable switch attached on said tunnelling layer on the side opposite said dielectric barrier layer, said elemental contacts defining areas of said bistable switch for preferential switching; an electrode layer in contact with one side of said bistable switch; means for providing a visual display in response to an electric field of predetermined magnitude applied thereacross formed as a layer on the other side of said bistable switch; an optically transparent conductive coating in contact with said means for providing a visual display; and a transparent face plate adjacent said transparent conductive coating for supporting said means for providing a visual display; so that when an electrical voltage sufficient in magnitude to provide said predetermined electric field magnitude is applied across said electrode and



said optically transparent conductive coating and the projected energy beam has sufficient energy and is directed to impinge upon said electrode, said bistable switch is triggered into a high conductance state and the voltage maintains the high conductance state, thereby causing said means for providing a visual display to luminesce and provide an image which corresponds to the points of impingement of the energy beam which has fine definition for sufficiently high density arrays of said elemental contacts, and which is maintained indefinitely until the voltage is removed.

3,908,149

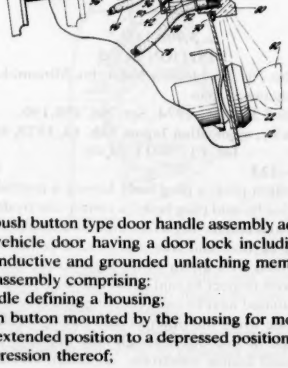
PUSH BUTTON TYPE DOOR HANDLE ASSEMBLY FOR ENERGIZING AN AUXILIARY LIGHTING CIRCUIT OF A VEHICLE

Bela Gergoe, Birmingham, and Paul F. Pelchat, Plymouth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1974, Ser. No. 515,183

Int. Cl.[2] B60Q *3/02*

U.S. Cl. 315—84 **3 Claims**



1. A push button type door handle assembly adapted for use with a vehicle door having a door lock including an electrically conductive and grounded unlatching member, the door handle assembly comprising:

a handle defining a housing;

a push button mounted by the housing for movement from an extended position to a depressed position upon manual depression thereof;

a spring for biasing the push button to the extended position;

an electrically conductive push rod of an elongated configuration with one end thereof mounted to the push button; an electrically conductive terminal mounted on the housing and defining an aperture that slidably receives the push rod in a guiding manner; and

an insulator on the push rod that engages the terminal to electrically isolate the push rod and terminal when the push button is in the extended position, the push rod sliding through the terminal upon manual depression of the push button so that the insulator moves out of engagement with the terminal as the push rod moves into electrical engagement therewith, and the manual depression of the push button moving the other end of the push rod into electrical contact with the electrically grounded unlatching member of the door lock so that the push rod electrically grounds the terminal upon such depression and thereby permits the handle assembly to be used to energize an auxiliary lighting circuit of the vehicle.

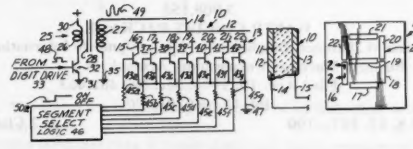
3,908,150
ELECTROLUMINESCENT DISPLAY AND METHOD FOR DRIVING THE SAME

Robert D. Webb, Hacienda Heights, Calif., assignor to Sigmatron, Inc., Santa Barbara, Calif.

No Drawing. Continuation of Ser. No. 196,434, Nov. 8, 1971, Pat. No. 3,813,575. This application Oct. 1, 1973, Ser. No. 402,378. The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.

Int. Cl.² H05B *37/00*

U.S. Cl. 315—167 **18 Claims**



1. An electroluminescent display system comprising: a capacitive electroluminescent diaplay having a pair of electrodes and an electroluminescent layer therebetween, the display having an inherent minimum useful illumination term for which term it must be actuated in order to be observed as an illuminated surface, and during which alternating current of voltage at least equal to a minimum actuating voltage necessary to cause visible illumination is applied thereto in order to create a luminous surface; a source of such alternating current having an output frequency such that the period of three of its cycles is less than the said minimum illumination term; and means for periodically and intermittently applying said alternating current to said electrodes in pulses, each pulse containing a number of contributing cycles of such amplitude as to contribute a significant increment of increased luminosity, the pulses being applied with such frequency that said contributing cycles are applied for actuation for a total time of less than about 25% of said minimum useful illumination term.

3,908,151
METHOD OF AND SYSTEM FOR INTRODUCING LOGIC INTO DISPLAY/MEMORY GASEOUS DISCHARGE DEVICES BY SPATIAL DISCHARGE TRANSFER

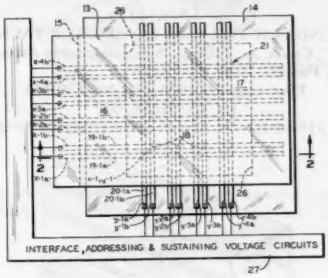
Jerry D. Schermerhorn, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

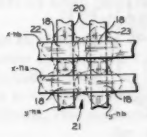
Filed June 22, 1973, Ser. No. 372,542

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **37 Claims**

1. The method of perfoming logic functions internally of a gas discharge display/memory device having plural discharge sub sites each comprising a conductor of a first conductor array having a portion proximate to a portion of a conductor of a second conductor array, a volume of ionizable gas in the vicinity of the proximate conductor portions and a dielectric layer between at least one conductor portion and the gas, a plurality of the sub sites being grouped in a physical arrangement as a discharge cell with a spacing within a range of mutual influence such that an on state of discharge in one sub site of the cell institutes an on state of discharge in the remaining sub sites of the cell when subjected to a sustaining voltage waveform, comprising the steps of: applying a sustaining voltage waveform across the first and second conductor arrays; and applying a turn on signal to a sub site of said cell during the continued application of the sustainer voltage whereby an on state of discharge is instituted in the remaining sub sites of the cell.





3,908,152
COORDINATE INDICATING DEVICE FOR INDICATING MEASURED VALUE PAIRS

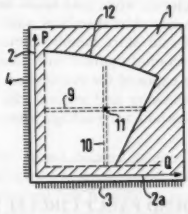
Karl Pfister, Nurnberg, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sept. 11, 1973, Ser. No. 396,249

Claims priority, application Germany, Sept. 22, 1972, 2246463

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **2 Claims**



1. In a coordinate indicating device having an electroluminescence plate, each side of the luminescence plate having closely adjacent, non-intersecting electrode strips, the electrode strips of both sides together forming a coordinate system; a pair of segment switch means having output terminals and means for connecting the electrode strips on each side of the luminescence plate with the output terminals of a respective one of said pair of segment switch means, and means defining a diagram on the luminescence plate for indicating a region having predetermined limits, respective electrode strips on each of the sides of the luminescence plate, when connected to the respective segment switch means,

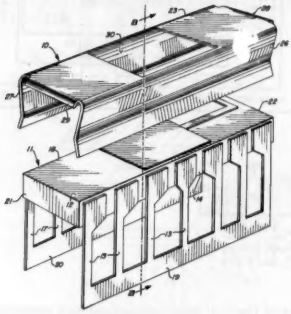
having an illuminated intersection representing an operating point, whereby a visual indication of the location of the operating point of a device inside or outside of predetermined operating limits defined by said diagram is presented on the electro-luminescence plate.

3,908,153

GROUND CLIP FOR SEMI-CONDUCTOR PACKAGE

George C. Cason, Jr., Phoenix, Ariz., assignor to Ascon Corporation, Phoenix, Ariz.

Filed Aug. 22, 1974, Ser. No. 499,454
Int. Cl.² H05F *3/02*
U.S. Cl. 317—2 R **2 Claims**



1. A single-piece ground clip for use in combination with a semi-conductor package, said package including a base member and integrated circuit chip carried on said base member and a plurality of leads extending downwardly from the periphery of said base member, said leads connected electrically to respective components of said chip, said ground clip comprising:

a. a cover member formed of electrically conductive material sized to overlay said base member;

b. skirt members formed integrally with said cover member and depending downwardly therefrom adapted to make electrical contact with each of said plurality of leads to maintain each of said leads at the same potential while said clip is engaged with said package; and

c. means for detachably securing said ground clip to said semi-conductor package such that the leads of said semi-conductor package can be electrically connected in the final intended circuit while said leads are still grounded by contact with said skirt members, said means comprising portions of said skirt members biased inwardly to make sliding frictional contact with said leads, allowing said leads to be exposed for connection in said final circuit and then allowing said ground clip to be detached from said semi-conductor package after said connection is effected.

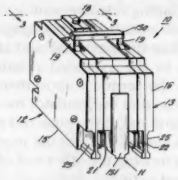
3,908,154

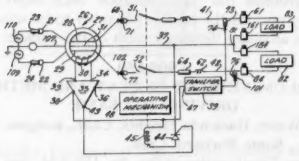
TWO POLE GROUND FAULT CIRCUIT PROTECTOR

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 13, 1974, Ser. No. 505,682
Int. Cl.² H01H *83/02, 83/22;* **H02H** *3/32, 7/22*
U.S. Cl. 317—18 R **13 Claims**

1. A ground fault circuit protector including first and second switch modules having respective first and second housings, and a detector control module having a third housing sandwiched between the first and second housings; each of said switch modules including separable cooperating contacts and a load terminal in circuit with said contacts; said detector-control module including first and second line terminals, a balanced transformer including first and second primary windings connected in circuit with the respective first and second line terminals, conductor means extending through the sides of the third housing and the sides of the first and second





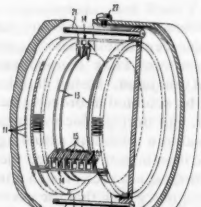
housings to connect the first primary winding in series with the contacts of said first module and to connect the second primary winding in series with the contacts of the second module.

3,908,155

WAFER CIRCUIT PACKAGE

Dean W. Skinner, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,463
Int. Cl.² H02B *1/00*
U.S. Cl. 317—100 **2 Claims**



1. A packaging assembly for wafer-type circuit devices comprising:

a. a flat base member fabricated of epoxy glass material,

b. a plurality of terminal contacts arranged in a circular array in said base member and adapted for connection with external circuit means,

c. a plurality of silicon circuit devices disposed as an aligned stack,

d. a plurality of wafer electrical interconnection busses mounted in the terminal contacts in said base member and each including a plurality of tuning-fork type connectors adapted for edge connecting with electrical surfaces on the silicon wafers and supporting the silicon wafers in spaced apart relationship,

e. a container encapsulating the wafer assembly and hermetically sealed to the base member and adapted to retain cooling fluid therein and provided with a cap in said container for introducing cooling fluid into the container, and

f. an upper and a lower buss guide member having a serrated peripheral edge designed to hold the interconnection busses in spaced apart arrangement.

3,908,156

INDUCTION MOTOR SPEED CONTROL APPARATUS

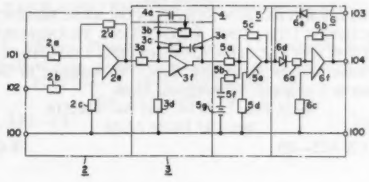
Nobuo Anzai, and Hiroshi Kamaike, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,718

Claims priority, application Japan, Dec. 19, 1972, 47-127499

Int. Cl. H02p *1/40*

U.S. Cl. 318—203 R **3 Claims**



1. Apparatus for controlling the speed of an induction motor comprising:

means for generating a preset command signal corresponding to the desired speed of the motor;

means for generating a first signal corresponding to the speed of the load of the motor;

means for generating a difference signal corresponding to the difference between the first signal and the preset command signal;

means for applying the difference signal to the motor to cause the motor to produce a rotating torque corresponding to the difference signal;

means for applying a rated voltage to the motor when the load is driven at its maximum speed;

means for presetting, prior to the deceleration of the load, a second signal corresponding to the load torque of the motor;

means for applying the second signal to the motor at the beginning of the deceleration of the load to prevent a discontinuity in the rotating torque of the motor during the time the motor is decelerated from its maximum speed.

3,908,157

ELECTROLYTIC CAPACITOR CONSTRUCTION AND SYSTEM

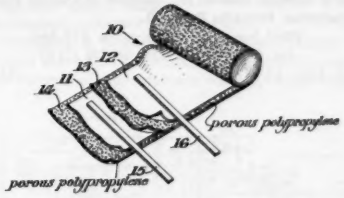
Sidney D. Ross; Franz S. Dunkl, both of Williamstown, Mass., and Clinton E. Hutchins, Pownal, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Filed Nov. 8, 1974, Ser. No. 522,200

Int. Cl.[2] H01G *9/02*

U.S. Cl. 317—230 **3 Claims**

1. In an electrolytic capacitor having a first and second electrode and a combination separating the electrodes of a spacer of porous polypropylene and an electrolyte impregnated in the spacer having an electrolyte solvent of the class



consisting of low boiling point amides, lactams, phosphate esters, phosphonamides, ether alcohols, and ether nitriles.

3,908,158

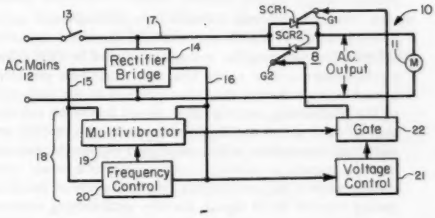
CONTROL SYSTEM FOR ADJUSTING A-C MOTOR SPEED AT LINE FREQUENCY OR A SUBHARMONIC OF THE LINE FREQUENCY

George H. Studtmann, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 364,441, May 9, 1973, abandoned, which is a continuation of Ser. No. 174,597, Aug. 25, 1971, abandoned. This application Sept. 16, 1974, Ser. No. 506,639

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **8 Claims**



1. an a-c motor speed control system for an a-c motor connected for energization from an a-c power line supplying power at a fundamental line frequency, comprising:

a bidirectional switch coupled between the power line and the motor, and control means coupled both to the poweer line and to the bidirectional switch, which control means includes

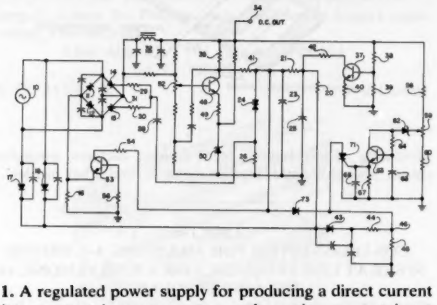
a countdown circuit coupled to and synchronized with the power line, connected to control the gating of the bidirectional switch at a gating frequency that is equal to, or a subharmonic of, the fundamental line frequency, and

a voltage control circuit, also coupled to and synchronized with the power line to control the gating of the bidirectional switch for all, or a variable amount less than all, of each individual half cycle of energy at the gating frequency determined by the bidirectional switch.

3,908,159
REGULATED POWER SUPPLY WITH START-UP AND PROTECTIVE CIRCUITS

Donald E. Griffey, Skokie, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

Filed June 3, 1974, Ser. No. 475,566
Int. Cl.[2] H02P *13/26*; **H02H** *7/127*
U.S. Cl. 321—11 **21 Claims**



1. A regulated power supply for producing a direct current voltage output in response to an alternating current input signal, including in combination:

gated unidirectional conductive means operated in response to a gating signal and coupled to receive alternating current signals for producing direct current signals on an output terminal thereof;

regulator means coupled with the output terminal of said unidirectional conductive means for regulating the magnitude of the direct current output voltage on said output terminal;

timing control means for producing a time varying voltage; voltage responsive switch means coupled to sense the time varying voltage from said timing control means and coupled to supply gating signals to said gated unidirectional conductive means in response to a first predetermined voltage sensed thereby; and

means coupled to sense current flow through said gated unidirectional conductive means and rendered operative thereby for clamping the voltage produced by said timing control means to a value less than said first predetermined voltage during the latter portion of the half-cycle of the alternating current input signal following conduction of said gated unidirectional conductive means and rendered inoperative when said gated unidirectional conductive means is rendered non-conductive upon commencement of the next succeeding half-cycle of the alternating current input signal, thereby establishing substantially the same starting voltage for said timing control means for each half-cycle of the input signal.

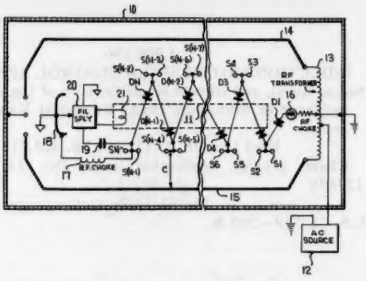
3,908,160
FILAMENT SUPPLY CIRCUIT FOR PARTICLE ACCELERATOR

Chester C. Thompson, Jr., Roslyn Heights, and Howard F. Malone, Massapequa Park, both of N.Y., assignors to Radiation Dynamics, Inc., Westbury, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,221
Int. Cl. H02m *7/00*
U.S. Cl. 321—15 **10 Claims**

1. In conjunction with a particle-accelerating device of the type having a filament and in which a beam of accelerated charged particles is supplied by a high DC voltage being generated by means of a rectifier-capacitor voltage multiplier unit driven by an RF primary voltage which is adjustable over a predetermined operating voltage range to adjust the beam energy, a filament power supply comprising:

voltage limiting means AC-coupled to said voltage multiplier unit for receiving RF primary voltage from said voltage multiplier unit and providing a limited RF voltage having a peak-to-peak amplitude which remains constant for adjustment of said primary voltage over said entire predetermined operating voltage range; and

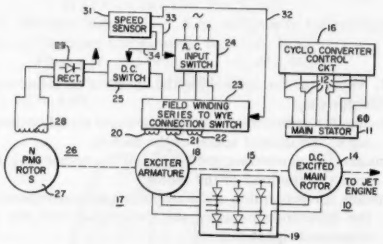


filament impedance-matching means for coupling said limited RF voltage from said voltage limiting means to said filament.

3,908,161
FIELD EXCITATION SYSTEM FOR SYNCHRONOUS MACHINES UTILIZING A ROTATING TRANSFORMER BRUSHLESS EXCITER GENERATING COMBINATION

Lawrence Waters Messenger, Erie, Pa., assignor to General Electric Company, Wilmington, Mass.

Filed Feb. 7, 1974, Ser. No. 440,516
Int. Cl.[2] F02N *11/08*
U.S. Cl. 322—29 **8 Claims**



1. A dynamoelectric machine which is to be operated both as a D.C. brushless motor and as a synchronous generator and an excitation system therefor, the combination comprising:

a. a dynamoelectric machine including

1. a rotating field winding mounted on a shaft,
2. stationary armature windings, means for applying alternating voltage to said armature windings when said dynamoelectric machine is operating as a D.C. brushless motor,

b. an exciter mounted on the same shaft as the field windings of the dynamoelectric machine, said exciter including rotating armature windings and stationary field windings,

c. means for rectifying the output from the rotating exciter armature windings to provide D.C. field excitation for the rotating field winding of said dynamoelectric machine both during operation of the dynamoelectric machine as a motor and as a synchronous generator,

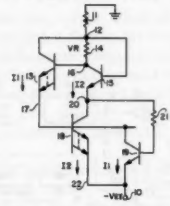
d. means for selectively operating said field as a rotating transformer when said dynamoelectric machine is operated as a motor to supply D.C. flux for said dynamoelectric machine when it operates as a motor and as an exciter generator when said dynamoelectric machine is driven as a generator to provide D.C. field excitation for the machine as a synchronous generator, said last named means including:

1. means for connecting said field winding in a polyphase connection and means for energizing the field wintling with a polyphase A.C. signal to produce a flux wave in the air gap of said exciter to induce an alternating voltage in the armature windings when the dynamoelectric machine is operated as a motor said alternating voltage being rectified in said rectifying means to provide excitation for the field windings and D.C. flux for the dynamoelectric machine whereby said dynamoelectric machine functions as a motor to drive a load, and
2. means for changing the energization of the exciter field winding to establish a D.C. field across the exciter air gap to generate an alternating voltage in the armature winding when the dynamoelectric machine is driven as a generator including means for reconnecting all of the polyphase windings in series and means to impress a D.C. voltage across said series connected field whereby said exciter provides D.C. field excitation for the dynamoelectric machine during generator operation and also provides D.C. flux when the machine operates as a motor from standstill up to speed.

3,908,162
VOLTAGE AND TEMPERATURE COMPENSATING SOURCE

Robert R. Marley, Phoenix, and Walter C. Seelbach, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Mar. 1, 1974, Ser. No. 447,198
Int. Cl.² G05F *3/08*
U.S. Cl. 323—19 **7 Claims**



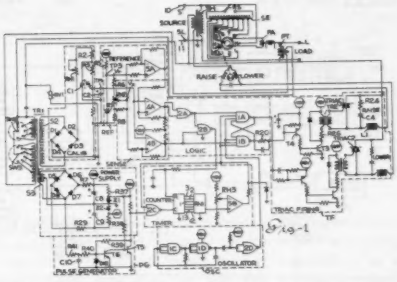
1. An integrated circuit voltage and temperature compensated circuit comprising:
   a. a reference impedance coupled to a voltage source, said voltage source generating a first and second current;
   b. a first path coupled to said impedance means for receiving said first current;
   c. a second path coupled to said reference impedance for receiving said second current;
   d. said first current path including at least two serially interconnected PN junctions for generating a first differential voltage;
   e. said second current path including at least two serially interconnected PN junctions for generating a second differential voltage; and
   f. said reference impedance means being responsive to said first and second differential voltages for generating a positive temperature coefficient voltage.

3,908,163
BANDWIDTH LIMIT CIRCUIT FOR STEP VOLTAGE REGULATOR

Thomas P. Gilmore, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 1, 1974, Ser. No. 520,037
Int. Cl.² G05F *1/20*
U.S. Cl. 323—43.5 S **10 Claims**

1. In a step voltage regulator adapted to maintain its output voltage within upper and lower bandwidth limit, a bandwidth limit sensing circuit comprising
   means for providing a sample voltage which is a function of the regulator output voltage,
   a predetermined reference voltage source,
   means including a bandwidth setting potentiometer for deriving a lower limit reference potential which is a preselected fraction of said reference voltage, means coupled

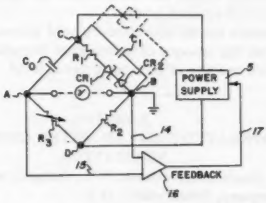


   to said reference voltage source and to said potentiometer for deriving an upper limit reference potential whose magnitude is equal to the sum of said reference voltage plus the difference between said reference voltage and said lower limit reference potential, and
   first and second voltage comparator means for comparing said sample voltage respectively to said upper limit reference potential and to said lower limit reference potential.

3,908,164
CORONA CURRENT MEASUREMENT AND CONTROL ARRANGEMENT

Delmer G. Parker, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1974, Ser. No. 511,831
Int. Cl.² G05F *1/10;* **H01T** *19/00*
U.S. Cl. 323—75 K **5 Claims**



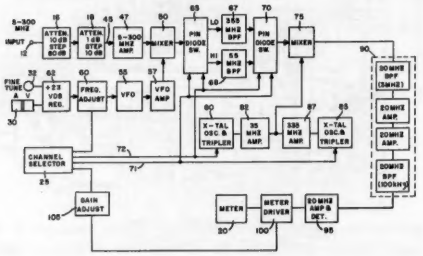
1. A bridge circuit for measuring the corona charging current deposited by an A.C. corona discharge device on a charge collecting surface, said corona device including an electrode spaced from said surface, said bridge having power input nodes and sensing nodes comprising
   an A.C. voltage source coupled to said input nodes,
   a first resistor coupled in series with said device across said input nodes to form a first current path,
   a capacitor and a second resistor connected in series across said input nodes to form a second current path in parallel with said first current path across said source,
   means coupled to said sensing nodes for measuring the output of said bridge, and,
   means for balancing said bridge when the output of said source is below the corona onset value whereby when the voltage of said source is raised above the corona onset potential, said corona charging current may be deter-

mined from the measured value of said imbalance and the value of said first resistor.

3,908,165
FIELD STRENGTH METER

Jack D. Cauldwell, Dayton, Ohio, assignor to Arvin Industries, Inc., Columbus, Ind.

Filed June 10, 1974, Ser. No. 477,776
Int. Cl.² G01R *17/00, 23/16*
U.S. Cl. 324—77 A **12 Claims**



1. A signal level instrument for indicating the level of an R.F. signal present in a circuit over a relatively wide range of frequency,

said instrument comprising

an input connection adapted to be connected to a signal source to be tested,

selectively operable attenuator means connected to receive a signal from said input connection and to attenuate the received signal to a predetermined level,

a channel selector adjustable to the frequency band of a particular signal being received at said input connection, said channel selector including a variable gain compensation control selected by said channel selector to provide a gain compensation related to differences in gain of the instrument circuitry at different frequencies,

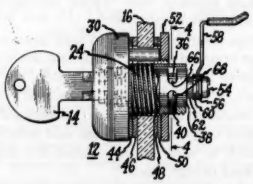
an indicator driven at a level corresponding to the output of said attenuator means and also compensated by a signal from said variable gain control to indicate when said attenuator means has attenuated the received signal to the predetermined level,

and readout means operated by said attenuator means to indicate the amount of attenuation introduced thereby as a direct reading of incoming signal level.

3,908,166
KEY OPERATED DEMAND METER COVER RESET MECHANISM

Ernest B. Shackford, Durham, N.H., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,957
Int. Cl.² G01R *19/16;* **G06C** *15/42*
U.S. Cl. 324—103 R **4 Claims**



1. In combination with a demand meter of the type having a demand register disposed inside a housing, the register being provided with a rotatable demand indicator and reset arm with one end of said reset arm adjacent a portion of said housing and mechanically engaging a reset actuator, the actuator transferring a reset torque applied outside the housing to the reset arm inside the housing, the improvement comprising that the reset actuator comprises:

a. a rotatable reset shaft, extending through the housing for transmitting a torque therethrough;

b. a bearing, fixedly mounted to said housing, for rotatably supporting said reset shaft;

c. means mounted between said reset shaft and said bearing, said means being operable to alternately prevent and permit rotation of said reset shaft with respect to said bearing;

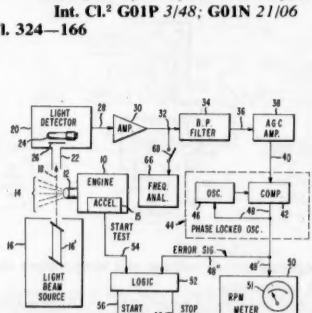
d. means for coupling a reset torque, applied to said reset shaft, to said demand indicator and reset arm; and

e. rotation limiting means incorporated in said reset actuator, said means having a limit stop mounted in fixed position relative to said housing for limiting the amount of rotation of said reset shaft with respect to said reset arm by reacting reset forces against said housing responsive to the reset arm being moved to a full reset position, thereby to terminate the application of reset force to the reset arm and to avoid overstressing said reset arm and the reset mechanisms associated therewith.

3,908,167
EXHAUST-RESPONSIVE ENGINE SPEED AND CONDITION INDICATOR

Leonard Robin Hulls, Marblehead, and Stephen Clow Hadden, Natick, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,444
Int. Cl.² G01P *3/48;* **G01N** *21/06*
U.S. Cl. 324—166 **9 Claims**



1. Apparatus responsive to the exhaust from an internal combustion engine having x ignitions per second depending on engine speed, and having y ignitions per revolution of the crankshaft depending on number of cylinders and whether two-stroke or four-stroke cycle, and having an engine speed in rpm equal to x times the constant $60/y$, comprising

means to project a light beam from a source through the exhaust gas exiting from the engine to a photodetector to produce an electrical signal having a frequency x Hz which varies directly with the operating speed of the engine,

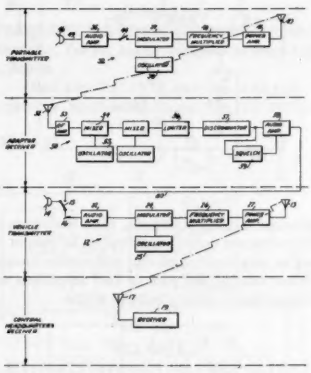
frequency detector means translating the varying frequency of said electrical signal to a corresponding amplitude varying signal, and

an electrical meter receptive to said amplitude varying signal and calibrated to indicate engine speed in revolutions per minute.

3,908,168
RADIO TRANSMISSION SYSTEM

John E. McMahon, West Covina, Calif., assignor to UDAK Corporation, West Covina, Calif.

Filed Dec. 6, 1973, Ser. No. 422,581
Int. Cl.[2] H04B 7/14
U.S. Cl. 325—1 3 Claims



1. A radio transmission system for use by the operator of a vehicle operating under relatively high background noise conditions,

said vehicle carrying a first relatively high powered radio transmitter having a first radio frequency output circuit and an audio frequency input circuit comprising:

a removable helmet carried by said operator,

a second relatively low powered radio transmitter carried by said helmet,

a microphone electrically connected to said second transmitter,

said microphone being carried by said helmet adjacent said operators mouth, and

an antenna integral throughout its length with said helmet and electrically connected to said second transmitter;

a radio receiver carried by said vehicle for receiving radio frequency signals transmitted by said second transmitter, said receiver having an audio frequency output circuit, and

means connecting said audio frequency output circuit to said audio frequency input circuit of said first transmitter.

3,908,169
FREQUENCY SHIFT DEMODULATOR HAVING A VARIABLE CLOCK RATE

Shih Yung Tong, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 22, 1974, Ser. No. 453,932
Int. Cl. H04l 27/14
U.S. Cl. 325—320 10 Claims

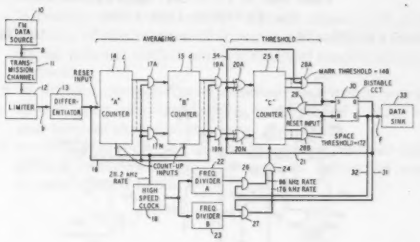
1. A frequency-shift demodulator for digital data encoded on signal waves having two or more preassigned discrete frequencies comprising

free-running high-speed counter means resettable to a reference state responsive to the passage through zero of received signal waves,

threshold counter means responsive to maximum count levels achieved by said high-speed counter means between said passages through zero,

means for supplying to said threshold counter means selectable counting rates proportional to said preassigned discrete frequencies,

means for establishing threshold count levels for the output of said threshold counter means corresponding to data transitions in said signal wave,



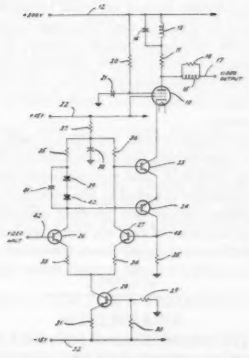
and

output means having two or more stable states responsive to the court level in said threshold counter means exceeding a particular threshold count level corresponding to a demodulated data state for selecting a predetermined counting rate for said threshold counter means.

3,908,170
HYBRID VIDEO AMPLIFIER

Frederick T. Buhler, Newark, Calif., assignor to Philco-Ford Corporation (Now Aeronutronic Ford Corporation), Blue Bell, Pa.

Filed Dec. 9, 1974, Ser. No. 530,754
Int. Cl.[2] H03F 5/00
U.S. Cl. 330—3 6 Claims



1. A transistor vacuum tube hybrid video amplifier comprising a vacuum tube having an output load resistor from which an output signal is taken and a driver circuit connected to vary the current flowing in said tube, said driver circuit comprising:

a pair of complementary transistors connected in series with the cathode of said tube

a differential transistor amplifier connected to said pair to drive said pair differentially, and

means for applying an input signal to at least one of the transistors in said differential amplifier.

3,908,171

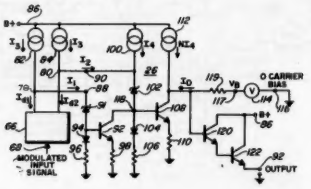
AMPLIFIER CIRCUIT SUITABLE FOR AMPLIFYING DIFFERENTIAL INPUT SIGNALS AND PROVIDING A SINGLE ENDED OUTPUT SIGNAL

Milton E. Wilcox, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 3, 1973, Ser. No. 421,368

Int. Cl.[2] H03F *3/04, 3/343*

U.S. Cl. 330—14 **10 Claims**



1. An amplifier circuit suitable for linearly amplifying first and second differential input signals respectively applied to first and second input terminals thereof by a differential driving source and providing a single-ended output signal at an output terminal thereof, the amplifier circuit including in combination:

first stage means having an input terminal for receiving the first differential signal and an output terminal, said first stage means inverting said first differential signal;

first circuit means coupling said input terminal of said first stage means to the first input terminal of the amplifier circuit;

first zener diode means included in said first circuit means for preventing the differential driving source from becoming saturated, said first zener diode means having one electrode coupled to the first input terminal of the amplifier circuit and another electrode coupled to said input terminal of said first stage means so that the first differential input signal flows therethrough;

bias means coupled to said first zener diode means;

second stage means having an input terminal connected to said output terminal of said first stage means, said second stage means having an output terminal which is coupled to the output terminal of the amplifier circuit;

second circuit means coupling the second input terminal of the amplifier circuit to said input terminal of said second stage means;

second zener diode means included in said second circuit means for preventing the differential driving source from becoming saturated, said second zener diode means having one electrode coupled to the second input terminal of the amplifier circuit and another electrode coupled to said input terminal of said second stage means so that the second differential signal flows therethrough; and

bias means coupled to said second zener diode means.

3,908,172

CIRCUIT ARRANGEMENT FOR INFLUENCING FREQUENCY RESPONSE BY ELECTRONIC MEANS, IN PARTICULAR ELECTRONIC TONE CONTROL CIRCUIT

Wilfried Aschermann, Hamburg, and Paul Bockelmann, Halstenbeck, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

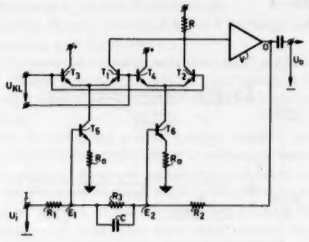
Filed Nov. 29, 1973, Ser. No. 420,269

Claims priority, application Germany, Dec. 19, 1972, 2262089

Int. Cl.[2] H03G *3/30;* **H03F** *1/08, 3/45*

U.S. Cl. 330—29 **14 Claims**

1. A circuit arrangement comprising first and second amplifiers, each of said amplifiers having an input and an output; a common output terminal coupled to said amplifier outputs; first and second input impedance networks having different transfer functions, each having an input means for receiving a single input signal and an output coupled to said amplifier inputs respectively; first and second feedback impedance networks for providing negative feedback around said amplifiers respectively, said networks comprising impedance means



having different transfer functions, each having an input coupled to said common output terminal an an output coupled to said amplifier inputs respectively; and means coupled to said amplifiers for varying the gain of said amplifiers in opposite senses in accordance with a control signal.

3,908,173

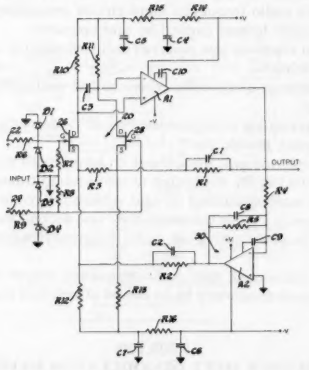
DIFFERENTIAL AMPLIFYING SYSTEM WITH FORCED DIFFERENTIAL FEEDBACK

Bruce K. Murdock, Goleta, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed May 13, 1974, Ser. No. 469,312

Int. Cl.[2] H03F *3/68*

U.S. Cl. 330—30 D **3 Claims**



1. A differential feedback amplifying system having balanced input capacity comprising:

a differential input, differential output amplifier stage including first and second three terminal amplifier means each having input, output, and common terminals, a common resistor interconnecting said common terminals;

a first operational amplifier having inverting and non-inverting inputs and a single ended output, means coupling the output terminal of said first amplifier means to said inverting input and coupling the output terminal of said second amplifier means to said non-inverting input;

a differential feedback loop including an in-phase channel and an out-of-phase channel, said in-phase channel including a resistor connecting the output of said first operational amplifier to the common terminal of said first amplifier means;

said out-of-phase channel including an inverting operational amplifier and a resistor, said resistor interconnecting the output of said inverting operational amplifier with the common terminal of said second amplifier means;

and means for receiving input signals at the input terminals of said amplifier means whereby an output signal proportional to the difference of said input signals is produced at the output of said first operational amplifier.

3,908,174

FREQUENCY AND PHASE COMPARATOR

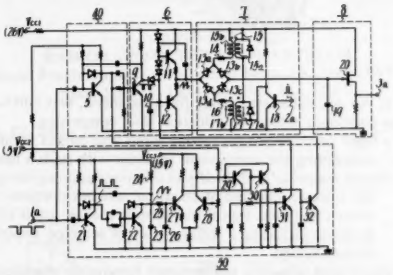
Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,514

Claims priority, application Japan, Jan. 29, 1973, 48-11766

Int. Cl.² H03B *3/06*

U.S. Cl. 331—11 **6 Claims**



1. A frequency and phase comparator comprising:

a. a reference signal oscillator,

b. a voltage controlled oscillator producing a rectangular wave signal,

c. means for generating a sawtooth wave signal supplied with said rectangular wave signal, said sawtooth wave signal having the same frequency as that of said rectangular wave signal,

d. a sampling and hold circuit supplied with said sawtooth wave signal and said reference signal and producing a DC signal proportional to the phase difference therebetween, said DC signal being supplied to said voltage controlled oscillator so as to phase lock its phase with respect to that of reference signal within a predetermined value,

e. means for discriminating the frequency difference of said reference signal and said rectangular wave signal and producing an output signal when the frequency difference exceeds a predetermined range,

f. control means supplied with said output signal so as to hold the amplitude of said sawtooth wave signal at its maximum or minimum values; whereby said frequency of said voltage controlled oscillator is controlled until the frequency difference falls within said predetermined frequency range.

3,908,175

RADIAL FLOW GAS DYNAMIC LASER

Frederick C. Damm, Florencia, Colombia, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,557

Int. Cl.² H01S *3/22*

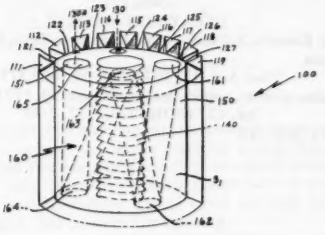
U.S. Cl. 331—94.5 G **7 Claims**

1. In a gas dynamic laser, for use with a source of a gaseous medium that is suitable for lasing, having a combustion chamber component connectable to said gaseous lasing medium source, a nozzle array component, comprising a plurality of nozzles each of which has an inlet and an outlet, downstream of and in communication with said combustion chamber component, a cavity component downstream of and in communication with said nozzle array component, a diffuser component downstream of and in communication with said cavity component, an exhaust component downstream of and in communication with said diffuser component, and a housing suitable for containing the aforesaid components, the improvement comprising:

a. a nozzle array component of toroidal shape, with said plurality of nozzles thereof arranged in a stack and forming an external surface and a cylindrical shaped internal surface;

b. a diffuser component surrounding, and in concentric spaced apart relationship with, said external surface of said toroidal shaped nozzle array component;

c. a cavity component of annular type shape between said diffuser component and said external surface of said toroidal shaped nozzle array component;



d. a plurality of suitably positioned mirrors disposed within the annular type shape cavity component between said diffuser component and said external surface of said toroidal shaped nozzle array component;

e. and, a housing having an outlet in that portion thereof which contains said annular type shaped cavity component, to permit an output laser beam emitted by said lasing action of said gaseous medium suitable for lasing, and with said housing also having at least one other outlet located in that portion thereof which contains said exhaust component, to permit the exhaust of the gaseous medium;

whereby when said combustion chamber component is connected to a source of gaseous medium that is suitable for lasing, and when said gaseous medium is combusted therein and is subsequently passed through said toroidal shaped nozzle array component, an outwardly radial supersonic flow of the gaseous medium is attained.

3,908,176

GALVANIC ISOLATOR FOR A FREQUENCY RANGE OF 40 TO 900 MHZ

Edward-Tjitze Onno De Boer, Leidschendam, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, Netherlands

Filed Mar. 7, 1974, Ser. No. 448,951

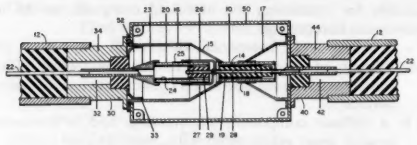
Claims priority, application Netherlands, Mar. 12, 1973, 7303447

Int. Cl.² H03H *7/02, 7/14*; **H01P** *3/06, 5/02*

U.S. Cl. 333—24 C **6 Claims**

1. A galvanic isolator for a coaxial transmission line for a frequency range of 40 to 900 MHz, comprising: two tubular capacitors, which are axially in line with each other and form part of said coaxial line, one of the capacitors being connected to the inner conductor of the coaxial line, which inner conductor extends through the other capacitor, and the other of said

capacitors being connected to the outer conductor of the coaxial line, the connection to the other capacitor comprising



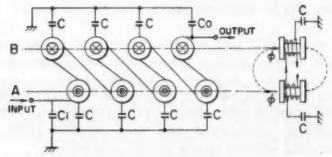
conductor cones that taper inwardly from the spaced ends of the outer conductor.

3,908,177

DELAY LINE DEVICE

Kazuo Kameya, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Apr. 12, 1974, Ser. No. 460,377
Claims priority, application Japan, Apr. 20, 1973, 48-44077
Int. Cl.[2] H03H *7/20, 7/32, 7/36*
U.S. Cl. 333—29 **13 Claims**



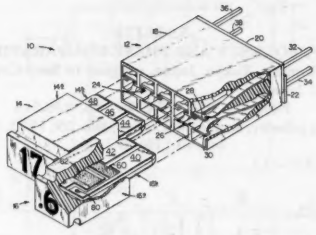
1. A delay line device comprising a first group of coils arrayed in a first straight row and equally spaced apart from each other, and a second group of coils arrayed in a second straight row and equally spaced apart from each other, said first and second straight rows being in substantially parallel spaced relationship with each other, such that one of the coils in said first group is located at one end of said first straight row and is adapted to serve as an input coil and one of the coils in said second group which is located at that end of said second group which corresponds to the other end of said first straight row is adapted to serve as an output coil, said first and second groups of coils being arranged so that said input coil in said first group is located at a position corresponding to a position between the coil in said second group which remotest from said output coil and the coil in said second group which is most adjacent to said coil remotest from said output coil and said output coil in said second group is located at a position corresponding to a position between the coil in said first group which is remotest from said input coil and the coil in said first group which is most adjacent to said coil remotest from said input coil, wherein electrical connection in zigzag form is provided between said first and second groups of coils so that said input coil in said first group is connected to that coil in said second group which is remotest from said output coil, the last-named remotest coil being connected to the coil in said first group which is most adjacent to said input coil, and finally that one of the coils in said first group which is remotest from said input coil is connected to said output coil in said second group, a tap being provided on each of the coils in said first and second groups, each of said taps being grounded through a capacitor.

3,908,178

PLUG-IN ADJUSTABLE ATTENUATOR CONSTRUCTION

Bill E. Johnson, and John E. Dannenmann, Jr., both of Portland, Oreg., assignors to Bejed, Inc., Portland, Oreg.

Filed May 28, 1974, Ser. No. 473,579
Int. Cl.[2] H03H *7/26*
U.S. Cl. 333—81 R **18 Claims**



1. An adustable attenuator for a balanced, two conductor, low frequency telecommunication line, comprising

a fixed pad component having input and output means for connecting the component in series with such a line,

circuit means in said fixed pad component comprising plural, series-connected attenuation network portions interconnecting said input and output means, each of said portions including a different set of selected impedance elements, and

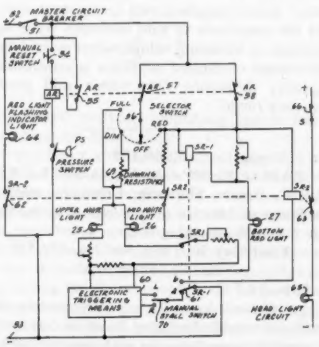
plural pad adjusting components removably connected to said fixed pad component, each of said pad adjusting components including impedance means combining with a different one of said network portions to provide a plurality of balanced attenuation networks connected in series between said input and output means, which networks cooperate to provide substantially equal attenuator input and output impedances.

3,908,179

COMBINATION WARNING LIGHT AND EMERGENCY FLASHER APPARATUS

Arthur C. Heehler, deceased, late of Park Ridge, Ill., by Robert I. Gustafson, executor, Chicago, Ill. (Natl. Bank of Austin), and Terry O'Neill, Delavan, Wis., assignors to Mercor Corporation, Franklin Park, Ill.

Filed Aug. 7, 1974, Ser. No. 495,418
Int. Cl.[2] B60Q *1/46;* **B61L** *29/24*
U.S. Cl. 340—81 R **8 Claims**



1. In a warning light apparatus for mounting on a vehicle consisting of:

a rectangular housing having a flat surface and a longitudinal axis extending along the length of said housing,

at least a pair of light mounting seats located along said longitudinal axis of said flat surface,

a first and a second light source rigidly mounted on said light mounting seats along said longitudinal axis,

said first light source oriented to project a beam of illumination downward and to the side of an imaginary line drawn perpendicular to said longitudinal axis of said flat surface,

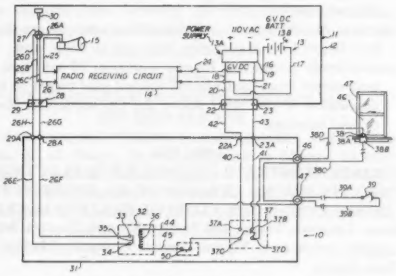
said second light source oriented to project a beam of illumination downward and to the opposite side of said perpendicular line in a mirrored relationship to said beam of illumination of said first light source,

a circuit means operable to continuously flash said first and second light sources from a fully illuminated condition to a dim condition.

3,908,180
RADIO CONNECTED ALARM SYSTEM

Herman Braginsky, P.O. Box 14, Old Saybrook, Conn. 06475

Filed Jan. 21, 1974, Ser. No. 434,814
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—220 **11 Claims**



1. A personal alarm system for guarding a person against the danger of fire and/or unlawful entry comprising a radio,

said radio including a radio receiving circuit, a speaker having a pair of leads connecting said speaker in circuit with said receiving circuit, wherein said speaker functions as an alarm for said alarm system, a power supply for energizing said receiving circuit, and a radio on-off switch means in series with said power supply and radio receiving circuit for energizing and de-energizing said receiving circuit,

electrically actuated means disposed in one of said speaker leads for interrupting the circuit to said speaker,

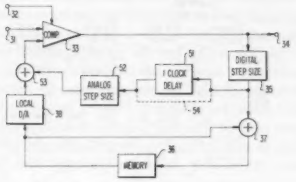
an alarm switch means for enabling said person to connect said electrically actuated means into and out of circuit with said power supply whereby the circuit to said speaker is interrupted when said alarm switch means is actuated,

and a detector means including a normally closed switch responsive to said danger connected in series with said alarm switch means and said electrically actuated means for completeing the circuit to said speaker when said detector means is activated in response to said danger.

3,908,181
PREDICTIVE CONVERSION BETWEEN SELF-CORRELATED ANALOG SIGNAL AND CORRESPONDING DIGITAL SIGNAL ACCORDING TO DIGITAL COMPANDED DELTA MODULATION

Seiichiro Shigaki; Hiroshi Iijima, and Haruo Kaneko, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Continuation of Ser. No. 357,053, May 3, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,572
Claims priority, application Japan, July 17, 1972, 47-71941
Int. Cl.[2] H03K *13/22*
U.S. Cl. 340—347 AD **9 Claims**



1. A converter for carrying out conversion between a digital signal of a certain type and a predicted analog signal, said digital signal consisting of a sequence of one-bit pulses each having a value dependent upon a comparison at a sample period of a self-correlated analog signal and said predicted analog signal, said converter comprising,

a. digital step size generator means responsive to each said one bit pulse and a number of immediately preceding one bit pulses for generating a digital step size signal representing one of at least three predetermined step sizes, the particular digital step size signal generated being dependent upon the pattern of said one bit pulses,

b. a delay circuit for delaying said digital step size signal by one sampling period,

c. means for deriving from the delayed digital step size signal a local digital signal,

d. an analog step size signal generator responsive to said local digital signal for generating an analog step size signal,

e. accumulator means responsive to said digital step size signals for accummulating a digital representation of the sum of the step sizes represented by said digital step size signal,

f. a local digital-to-analog converter for converting said accumulated digital representation into a local analog signal, and

g. an analog adder for deriving an analog algebraic sum of said local analog signal and said analog step size signal, said analog algebraic sum corresponding to said predicted analog signal.

3,908,182
NON-VOLATILE MEMORY CELL

Donald R. Lampe, Ellicott City; Marvin H. White, Laurel, and Franklyn C. Blaha, Glen Burnie, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,339
Int. Cl.[2] H01L *29/78;* **G11C** *11/40*
U.S. Cl. 357—24 **12 Claims**

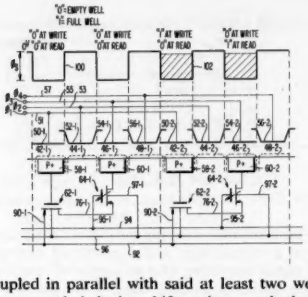
1. A functional non-volatile memory cell, comprising in combination:

a stage of a charge coupled device shift register having at least two potential wells capable of holding minority carriers, and a respective adjacent barrier to the flow of minority carriers and having means for applying bias potentials to said wells for selectively moving and holding said minority carriers;

first and second means respectively coupled to said at least two wells, said means being adapted to selectively sense the surface potential in the respective wells as well as inject charge therein;

a semiconductor address switch device external to said charge coupled device shift register and having a control electrode and two charge transfer electrodes;

a semiconductor memory device external to said charge coupled device shift register and having a reversible electrically-shiftable conduction threshold, a control electrode and two charge transfer electrodes, and being connected in series with said switch device by means of a respective charge transfer electrode, with both devices



being coupled in parallel with said at least two wells of said charge coupled device shift register such that said control electrode of said switch device is coupled to said first means and the other charge transfer electrode of said memory device is coupled to said second means; and

means for applying predetermined bias potentials to the other charge transfer electrode of said switch device and to the substrate and control electrode of said memory device during selective WRITE/READ modes of operation for selectively setting the threshold level of said memory device during the WRITE mode and effecting the charge transfer therefrom to one of said two wells of said shift register stage during the READ mode.

3,908,183

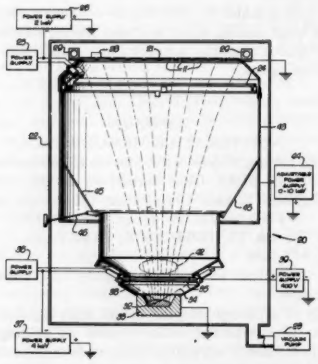
COMBINED ION IMPLANTATION AND KINETIC TRANSPORT DEPOSITION PROCESS

Robert M. Ennis, Jr., Santa Monica, Calif., assignor to California Linear Circuits, Inc., La Mirada, Calif.

Filed Mar. 14, 1973, Ser. No. 341,153

Int. Cl.[2] B05C *5/00;* **B44D** *1/18;* **B05B** *5/00;* **B01J** *17/00*

U.S. Cl. 357—65 **38 Claims**



1. A combined ion implantation and kinetic transport deposition process comprising:

vaporizing a solid source material within a chamber under high vacuum using an electron beam directed toward said solid source material, said beam also ionizing a portion of the vaporized particles of source material, thereby forming an expanding plasma,

implanting ions from said plasma into a target by electrostatically accelerating said ions toward said target for implantation therein in the absence of an external magnetic field, while permitting kinetically transported atoms from said plasma to deposit as a layer atop the ion implanted region of said target.

12. A process for the formation of a semiconductor device including a shallow junction and an ohmic contact therefor, comprising:

placing a semiconductor wafer in a chamber,

evacuating said chamber to a high vacuum,

using an electron beam to vaporize source material within said evacuated chamber, said beam ionizing some of the vaporized material, and

electrostatically accelerating said ionized material toward said wafer with sufficient energy to implant said ions into a shallow region of said wafer, non-ionized vaporized particles of source material being deposited atop the surface of said wafer region concurrent with said ion implantation to begin contact formation.

24. A process for depositing a layer of a second material onto a stratum of a first material, comprising:

placing a target including said stratum into a chamber and evacuating said chamber,

producing in said evacuated chamber an expanding plasma source including both ions and non-ionized atoms of said second material,

electrostatically accelerating ions from said plasma toward said target for implantation into said stratum, and

concurrently permitting kinetic transport of said non-ionized atoms from said plasma toward said target to begin deposition of said layer above the ion implanted portion of said stratum.

3,908,184

CERAMIC SUBSTRATE ASSEMBLY FOR ELECTRONIC CIRCUITS HAVING CERAMIC FILMS THEREON FOR INTERCEPTING THE FLOW OF BRAZING AGENTS

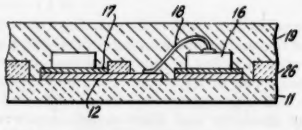
Shinzo Anazawa, Tokyo, and Toshiro Kuroda, Nagoya, both of Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,801

Claims priority, application Japan, Jan. 30, 1973, 48-12285

Int. Cl.[2] H01L *23/28*

U.S. Cl. 357—72 **7 Claims**



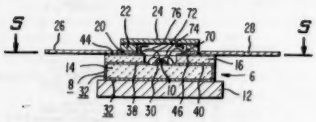
1. In a substrate assembly for electronic circuit elements comprising a ceramic substrate having a plurality of conductive films formed thereon, each of a selected conductive film of said plurality having a first area on which one of said electronic circuit element is brazed by means of a brazing agent and a second area to which a bond connected to one of said electric circuit elements brazed on a different conductive film is attached, the improvement which comprises, at least one ceramic film formed integral with said ceramic substrate of substantially the same material as said ceramic substrate, said integral ceramic film being disposed on said substrate so as to cover that portion of each of said predetermined conductive film which lies between said first area and said second area to intercept any undesired flow of said brazing agent from said first area to said second area.

3,908,185

HIGH FREQUENCY SEMICONDUCTOR DEVICE HAVING IMPROVED METALLIZED PATTERNS

Irving Edwin Martin, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,697
Int. Cl.[2] H01L 23/02, 23/12
U.S. Cl. 357—74 10 Claims



1. A semiconductor device comprising:

an insulating member having a first conductive area on a surface thereof, and a second conductive area on said member in generally spaced apart, surrounding relation with said first conductive area,

a semiconductor pellet mounted on said first area, and first and second conductive means electrically connecting portions of said pellet to different portions of said second area,

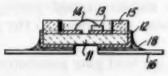
the paths for current between said different portions through said second area being of substantially uniform length by virtue of the shortest paths for said current through said second area being substantially longer than the shortest paths between said different portions along surfaces of said member not intersecting said first area.

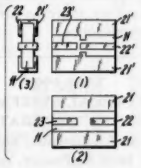
3,908,186

PACKAGED SEMICONDUCTOR DEVICE FOR MICROWAVE USE

Shinzo Anazawa; Seiichi Ueno; Isamu Nagasako, and Shigeru Sando, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed June 20, 1974, Ser. No. 481,458
Claims priority, application Japan, June 22, 1973, 48-69729
Int. Cl.[2] H01L 23/48, 39/02
U.S. Cl. 357—80 6 Claims





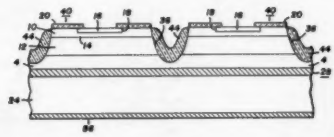
1. A packaged semiconductor device for use in the microwave frequency region, comprising a flat rectangular substrate of a dielectric material having substantially parallel top and bottom surfaces, first, second, third and fourth conductive layers formed on said substrate, a transistor element operable in the microwave frequency region, each of said layers having a first part formed on said top surface, a second part formed on said side surface, and a third part formed on said bottom surface, said first, second and third parts being electrically connected with each other, first, second and third parts of said first conductive layer extending along and over the entire length of one side of said substrate, the first, second, and third parts of said second conductive layer extending along and over the entire length of the opposite side of said substrate to said one side and in parallel with said first, second and third parts of said first conductive layer, respectively; the first, second and third parts of said third and fourth conductive layers being arranged respectively between said first, second and third parts of said first conductive layer and said first, second and third parts of said second conductive layer and extending in parallel with said first and second conductive layers, first parts of said third and fourth conductive layers being arranged in line, third parts of said third and fourth conductive layers being arranged in line, the first part of each conductive layer overlapping only with its own third part when viewed in a direction normal to said substrate; the collector of said transistor element being connected to said first part of said third conductive layer, the base of said transistor element being connected to said first part of said fourth conductive layer, and the emitter of said transistor element being connected to said first parts of said first and second conductive layers; and lead-out conductors respectively connected to said third parts of said first, second, third, and fourth conductive layers.

3,908,187

HIGH VOLTAGE POWER TRANSISTOR AND METHOD FOR MAKING

Gary S. Sheldon, Union Springs, and Peter S. Shen, Auburn, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 320,313, Jan. 2, 1973, abandoned.
This application May 3, 1974, Ser. No. 466,636
Int. Cl.[2] H01L 23/02
U.S. Cl. 357—81 3 Claims



1. A composite semiconductor structure constituting a plurality of power transistors comprising:

a. a junction wafer of monocrystalline silicon containing in stacked relation an outer collector layer of relatively low resistivity and defining the bottom major face of said junction wafer, an inner collector layer of relatively high resistivity surmounting said collector layer, a base layer surmounting said inner collector layer and defining therewith a base collector P/N junction, and an array of spaced emitter regions on said base layer and defining with the exposed surface of said base layer the top major face of said junction wafer,

b. a silicon carrier wafer for supporting and reinforcing said junction wafer,

c. menas forming a metallic alloy bond between the bottom major face of the junction wafer and the top major face of the carrier wafer, wherein the carrier wafer and the metallic alloy bond are substantially coextensive with the junction wafer and the bottom major face of said carrier wafer is covered in its entirety by a metallic collector contact layer in ohmic contact therewith,

d. means forming a plurality of grooves in the top major face of the junction wafer, between the emitter regions thereof, and having a depth extending part way through said outer collector layer, said grooves defining mesas in said junction wafer with each of said mesas including a portion of said outer collector layer surmounted by a

portion of said inner collector layer topped by a portion of said base layer and an emitter region thereon,

e. and a coating of glass passivating material on the side walls and bottom of said grooves covering the exposed edges of the interfaces between the base and inner collector region in each mesa and the inner collector region and outer collector region in each mesa, whereby said bonded wafers can be subdivided into individual transistor pellets at separation faces extending generally normal to the major faces of said wafers along the bottom of said grooves.

3,908,188

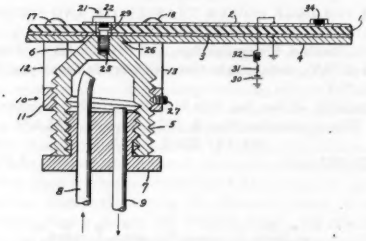
HEAT SINK FOR MICROSTRIP CIRCUIT

Hirohisa Kawamoto, Kendall Park, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1974, Ser. No. 497,415

Int. Cl.[2] H01L *25/04*; **H01P** *3/00*; **H02B** *1/00*; **H01B** *7/34*

U.S. Cl. 357—82 **2 Claims**



1. An individual heat sink for a solid state diode in a microwave stripline circuit, said diode being in a standard package of the type in which one diode terminal is a conductive cap and the other a conductive threaded stud concentric with the cap but of smaller diameter, and said stripline circuit being in the form of a conductive ground plane, a layer of insulation over the ground plane, and a conductive strip on the insulation, said heat sink comprising: a body made of a material of good heat and electrical conductivity in the form of a hollow externally threaded cylinder with end closures forming a cavity, one end closure being in the form of a truncated cone having at the center of its flat top a blind hole tapped to receive the threaded stud of the diode package and the other end closure containing inlet and outlet conduits for the passage of a liquid coolant through said cavity; and a holder attached to the strip-line structure beneath the ground plane, said holder having a circular opening with axis normal to the ground plane and threaded to receive the externally threaded heat sink body, whereby said body may be screwed into said holder with its truncated end facing said ground plane until the truncated end is in contact with the ground plane, and whereby said diode package may be screwed into the truncated end of said body through aligned holes in the conductive strip, insulation, and ground plane of the stripline structure, which holes are larger in diameter than said stud but smaller than said cap, until the stripline structure is compressed between the cap of the diode package and the truncated end of said heat sink body to provide good electrical contact between the stripline and the diode terminals.

3,908,189

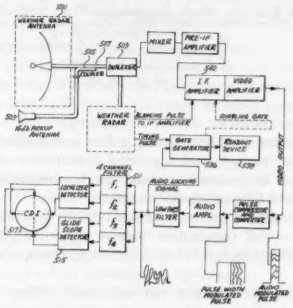
AIRBORNE RADAR INSTRUMENT LANDING SYSTEM

Walter E. Buehler, 5344 232nd Ave., S.E., Issaquah, Wash. 98027, and Clarence D. Lunden, Rt. 2, Box 890, Tacoma, Wash. 98423

Division of Ser. No. 210,448, Dec. 21, 1971, Pat. No. 3,787,841. This application June 27, 1973, Ser. No. 374,167

Int. Cl. G01s *1/14*

U.S. Cl. 343—5 LS **1 Claim**



1. A microwave guidance system for landing an airplane comprising in combination:

ground-based reflector means;

an airplane based weather radar receiver and transmitter, said receiver including a sensitivity time control circuit adjusted to provide a sensitivity proportional to range $^{-4}$, said transmitter providing pulsed continuous wave energy for illuminating said ground based reflector means;

said ground based reflector means including means for tone modulating said pulsed continuous wave energy at a plurality of audio frequencies;

means coupled to said weather radar receiver for detecting the relative amplitudes of said tone modulated pulsed continuous wave energy at said plurality of audio frequencies and indicating the deviation of the airplane from flight path;

and further including:

gate generator means in said receiver for generating an adjustable ramp referenced to the main pulse from said transmitter;

means for locking said gate generator on the reflected signal;

means for deriving an enabling gate pulse from the signal locked gate of said gate generator means; and

means for coupling said derived enabling gate pulse to I.F. stage of said receiver thereby providing reduction of ground clutter interference.

3,908,190

ANALOG TO LOGICAL SYSTEM FOR RANGE MEASUREMENTS INCORPORATING A RADAR

Guy E. Nathan, Issy-les-Moulineaux, and Claude A. Varaud, Nogent-sur-Marne, both of France, assignors to Constructions Navales et Industrielles de la Mediterranee C.N.I.M., Paris, France

Filed Feb. 9, 1973, Ser. No. 331,297

Claims priority, application France, Feb. 10, 1972, 72.04536

Int. Cl.[2] G01S *9/37*

U.S. Cl. 343—12 R **4 Claims**

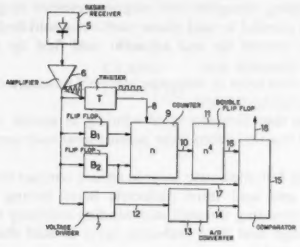
1. An analogue to digital system for detecting the range of a target at some predetermined distance for use with a continuously emitting radar, comprising:

first and second flip-flops connected to the receiver of said radar, each being responsive to a different voltage level

of the signal received by said radar receiver; said first and second flip-flops having known low triggering voltage thresholds;

pulse counting means operative to start a count responsive to the output of said first flip-flop and to stop said count responsive to the output of said second flip-flop;

trigger means connected to said radar receiver for transforming the pulses of said signal into shaped pulses for input into said counting means; and



reckoning logic circuit means including means connected to said radar receiver and responsive to said received signal for producing a signal corresponding to the range of said target, said reckoning logic circuit means being responsive to the final output count of said counting means to operate on and compare said final output count of said counting means and said signal corresponding to the range of said target to provide an indication when the distance between said radar and said target corresponds to said predetermined distance.

3,908,191

APPARATUS FOR ELECTROSTATIC PRINTING WITH MOVABLE ELECTRODES

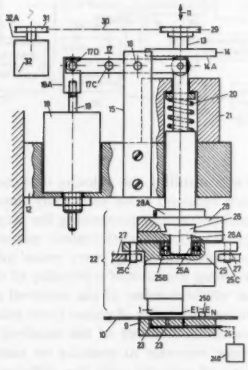
Gabor Forgo; Erwin Meyer, and Karl Moser, all of Zurich, Switzerland, assignors to Zellweger Uster AG, Uster, Switzerland

Division of Ser. No. 272,067, July 14, 1972, Pat. No. 3,875,320. This application Oct. 15, 1973, Ser. No. 406,705

Claims priority, application Switzerland, Aug. 16, 1971, 12104/71

Int. Cl.[2] G03G *15/048*

U.S. Cl. 346—74 ES **23 Claims**



1. An apparatus for producing printed images on a carrier by electrostatic printing techniques, comprising:

an electrode arrangement including a plurality of electrode elements each having a predetermined size for forming a latent electrostatic charge image on a carrier;

a counterelectrode arranged in confronting relation and spaced from said electrode arrangement for receiving, between said counterelectrode and said electrode arrangement, a carrier adapted to receive a latent electrostatic charge image;

means for applying a constant voltage between selective ones of said plurality of electrode elements and said counterelectrode to form a latent electrostatic charge image on a carrier positioned therebetween; and

means for producing on the carrier a latent electrostatic charge image of a size larger than the predetermined size of said electrode elements, said image-producing means including means for moving said carrier and said electrode arrangement relatively of each other in alternate directions during the application of said constant voltage between the selected electrode elements and the counterelectrode.

3,908,192

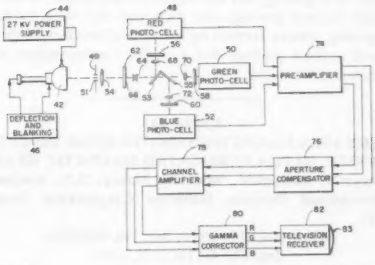
STANDARD AND COLOR TELEVISION REPRODUCTION FROM SUPERPOSED MONOCHROME IMAGES APPARATUS AND METHOD

Clark N. Kurtz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,458

Int. Cl. H03b *33/00*

U.S. Cl. 358—5 **11 Claims**



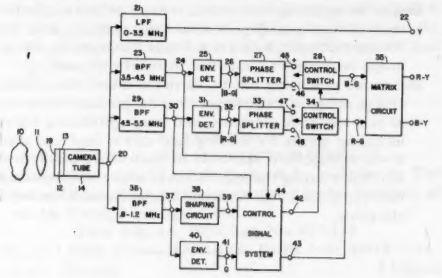
7. A method for reconstructing a color image on the display tube of a television receiver from a photostorage element containing at least two component scenes and associated diffraction gratings comprising:

scanning the photostorage element through an aperture with focused light to produce a light beam modulated by and representative of the component scenes and gratings of the photostorage element and carrying a plurality of orders of images of the aperture including the first order, focusing the first order images of the aperture on photoelectric transducers for producing electrical signals which are representative of the intensity of such focused first order images and applying the electrical signals to the television receiver to produce a color image on the display tube corresponding to the optically combined component scenes.

3,908,193
COLOR TELEVISION ENCODING AND DECODING SYSTEM

Albert Macovski, 4100 Mackay Dr., Palo Alto, Calif. 94306

Continuation-in-part of Ser. No. 309,908, Nov. 27, 1972, abandoned. This application Oct. 9, 1973, Ser. No. 404,775
Int. Cl.[2] H04N *9/07*
U.S. Cl. 358—47 **35 Claims**



1. Apparatus for encoding color information from a scene onto a photosensitive surface comprising:

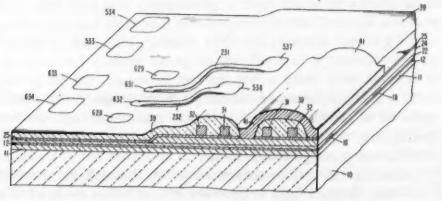
a first grating in the optical path between the scene and the photosensitive surface having alternate stripes each transmitting a different color whose projections onto the photosensitive surface produce equal response for white light from the scene; and

a second grating, in substantially the same plane as the first grating, having alternate stripes of a different spatial frequency than those of the first grating, each transmitting a different color whose projections onto the photosensitive surface produce equal response for white light from the scene where at least one of the stripes of the second grating has a color different from any of those of the first grating and the colors of the stripes of the first and second gratings are such that the heat frequency grating pattern formed by the optical product of the first and second gratings has a polarity independent of the color of the scene.

3,908,194
INTEGRATED MAGNETORESISTIVE READ, INDUCTIVE WRITE, BATCH FABRICATED MAGNETIC HEAD

Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,504
Int. Cl.[2] G11B *5/30, 5/42*
U.S. Cl. 360—113 **20 Claims**



1. A magnetic recording head for reading from and writing onto a magnetic recording medium comprising:

a first magnetic shield of permeable material having substantially planar surface and a first tip end,

a first, thin film layer of dielectric material in secure contact with said planar surface of said shield,

a thin film magnetoresistive stripe form of magnetic writing head structure in secure contact with said first layer of dielectric material aligned longitudinally adjacent to said tip end at the end of said head adapted to face said recording medium,

a second thin film layer of dielectric material in secure contact with said first layer of dielectric and said magnetoresistive structure,

thin film conductor means connected to terminals of said magnetoresistive stripe,

a thin film shielding-leg layer of a magnetically permeable material providing a second shield and a first write leg in secure contact with said second layer of dielectric material extending alongside said magnetoresistive stripe substantially parallel to said planar surface of said first shield having a second tip end adjacent said first tip end to define a magnetic gap,

a third thin film layer of dielectric material in secure contact with said second shield,

at least one thin film electrical winding in secure contact with said third thin film layer passing near said second tip end,

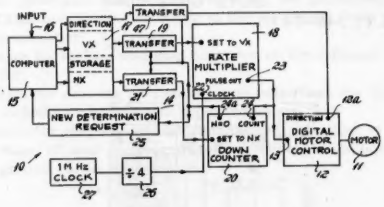
a fourth thin film dielectric layer in secure contact with said winding and said third dielectric layer having a slot therein extending through said winding centrally thereof and through said third dielectric layer to said shielding-leg layer, and

a second leg layer having a third tip end aligned with said first and second tip ends and extending through said slot into magnetic contact with said shielding-leg layer whereby said winding extends between said shielding-leg layer and said second leg layer for providing magnetic writing fields across the gap between said tip ends of said shielding-leg layer and said second leg layer.

3,908,195
DIGITALLY DETERMINED VELOCITY CONTROL METHOD AND MEANS FOR A DIGITAL MOTOR SYSTEM

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Jan. 16, 1974, Ser. No. 433,844
Int. Cl.[2] G05B *19/40;* **G06F** *15/46*
U.S. Cl. 444—1 **17 Claims**



1. A method for controlling the velocity of a motor means that translates each received pulse essentially simultaneously into an incremental movement comprising the steps of determining the change of velocity that the motor means is capable of responding to while translating every pulse into a motor movement, determining for each of a plurality of consecutive time intervals the whole number of the received pulses with there normally being a plurality of pulses in an interval, limiting the difference in the number of the received pulses between adjacent time intervals to produce no more than the determined change of velocity with the difference being a whole number of pulses and supplying the determined number of pulses at an approximately even rate during each time interval.

DESIGN PATENTS

GRANTED SEPTEMBER 23, 1975

ERRATA

For CLASS	See PATENT NO.
007–136	236,867

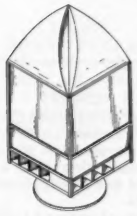
DESIGNS

SEPTEMBER 23, 1975

236,858
APRON
Doris Brosk, 150 E. 69th St., New York, N.Y. 10021
Filed Sept. 17, 1973, Ser. No. 397,811
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—227

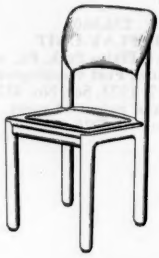
236,859
NECK-TIE SUPPORT
Zenko Wada, Tokyo, Japan, assignor to Seiwa Co., Ltd., Tokyo, Japan
Filed May 17, 1973, Ser. No. 361,220
Claims priority, application Japan Feb. 28, 1973
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—359

236,860
DISPLAY UNIT
Martin M. Berger, Elkins Park, Pa., assignor to Leg Lure, Inc., Fort Washington, Pa.
Filed Dec. 7, 1973, Ser. No. 422,634
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—25

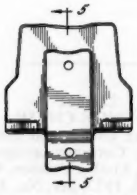


236,861
LOUNGE CHAIR
Michael Conrad, Detlef Unger, and Hans Hugo Werner, Frankfurt am Main, Germany, assignors to Wilkhahn, Wilkening & Hahne, Eimbeckhausen, Germany
Filed May 3, 1973, Ser. No. 356,945
Claims priority, application Austria Nov. 17, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38

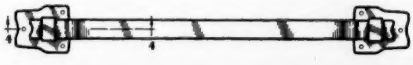
236,862
CHAIR
Raymond Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Jan. 22, 1974, Ser. No. 435,448
Claims priority, application France July 25, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78



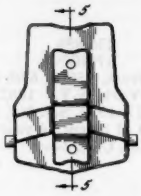
236,863
SOAP DISH BRACKET
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Original design application Jan. 4, 1974, Ser. No. 430,938. Divided and this application Sept. 3, 1974, Ser. No. 502,884
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—90



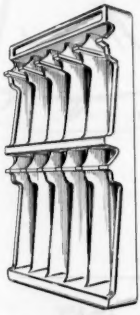
236,864
TOWEL BAR
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Original design application Jan. 4, 1974, Ser. No. 427,841. Divided and this application Sept. 3, 1974, Ser. No. 502,622
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—99



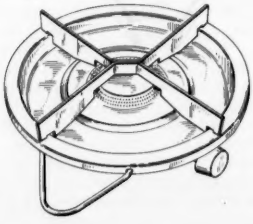
236,865
TOWEL RING BASE
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Original design application Jan. 4, 1974, Ser. No. 430,938. Divided and this application Sept. 3, 1974, Ser. No. 502,623
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D6—103



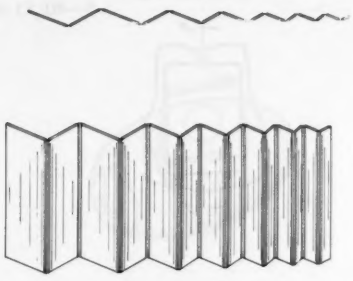
236,866
DISPLAY RACK FOR MERCHANDISE
Robert C. Barry, Newtown Square, Pa., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Oct. 23, 1973, Ser. No. 408,614
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—130



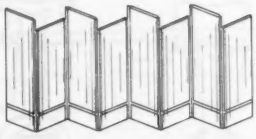
236,867
COMBINATION BURNER AND REFLECTOR FOR A CAMP STOVE OR THE LIKE
Anders John Horholt, % Ola Lindstrand, 9 Avenue d'Ostende, Monte Carlo, Monaco
Filed Sept. 14, 1973, Ser. No. 397,590
Claims priority, application Sweden Mar. 16, 1973
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—136



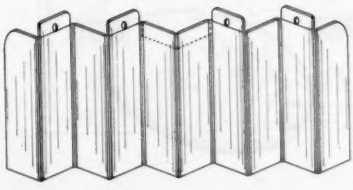
236,868
FOLDING SCREEN
Abraham Levy, 44 Alumim St., Afeca, Tel Aviv, Israel
Filed Oct. 26, 1973, Ser. No. 410,260
Claims priority, application Israel June 28, 1973
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139



236,869
FOLDING SCREEN
Abraham Levy, 44 Alumim St., Afeca, Tel Aviv, Israel
Filed Oct. 26, 1973, Ser. No. 409,906
Claims priority, application Israel June 28, 1973
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139



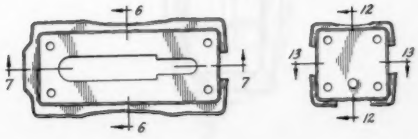
236,870
FOLDING SCREEN
Abraham Levy, 44 Alumim St., Afeca, Tel Aviv, Israel
Filed Oct. 26, 1973, Ser. No. 410,203
Claims priority, application Israel July 9, 1973
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139



236,871
WOOD HOLDER
Wesley G. Lampinen, Richardson Road, Ashby, Mass. 01431
Filed July 29, 1974, Ser. No. 492,605
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—212

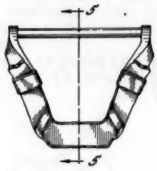
236,872
BOARD PULLER
Walter E. Froehlich, 220 Oak Ave., Galt, Calif. 95632
Filed Feb. 7, 1974, Ser. No. 440,289
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—89

236,873
SECURITY GUARD
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Original design application Dec. 26, 1973, Ser. No. 428,363. Divided and this application Dec. 18, 1974, Ser. No. 533,962
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—131

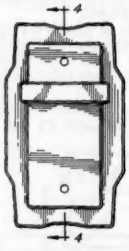


236,874
PULL
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Continuation-in-part of design application Ser. No. 312,781, Dec. 6, 1972, which is a continuation-in-part of abandoned design application Ser. No. 209,501, Dec. 17, 1971. This application Dec. 26, 1973, Ser. No. 427,841
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166

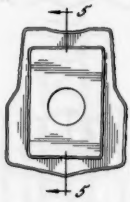
236,875
DOOR KNOCKER RING
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Jan. 4, 1974, Ser. No. 430,939
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—177



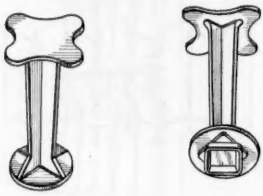
236,876
DOOR KNOCKER PLATE
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Original design application Dec. 26, 1973, Ser. No. 428,363. Divided and this application Dec. 18, 1974, Ser. No. 533,952
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—177



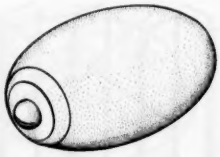
236,877
ESCUTCHEON FOR A DEADLOCK
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Jan. 4, 1974, Ser. No. 430,938
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179



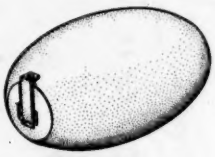
236,878
DISTRIBUTING POST FOR TELEPHONE WIRING BACK PANELS
Larry L. Sharp, Schaumburg, and Edmund J. Soltysik, Chicago, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed June 24, 1974, Ser. No. 482,216
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229



236.879
DISPENSING CONTAINER
Boris Sway, 7201 W. Aracoma Drive, Cincinnati, Ohio 45237
Filed May 21, 1973, Ser. No. 361,928
Term of patent 14 years
The term of this patent subsequent to Aug. 14, 1987, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—2

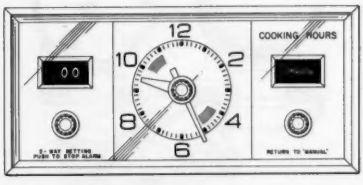


236,880
DISPENSING CONTAINER
Boris Sway, 7201 W. Aracoma Drive, Cincinnati, Ohio 45237
Filed May 21, 1973, Ser. No. 361,927
Term of patent 14 years
The term of this patent subsequent to Aug. 14, 1987, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—2

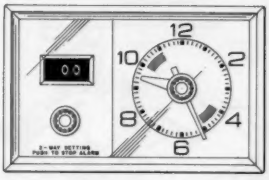


236,881
PACKAGING CONTAINER FOR FILM PROCESSING CHEMICALS
Donald J. Mitchell, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company
Filed Jan. 2, 1974, Ser. No. 429,541
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

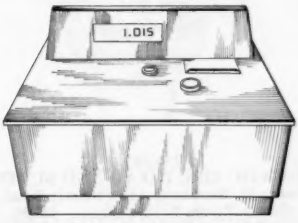
236,882
COMBINED CLOCK AND TIMER
Paul T. Flumm, Oakville, Conn., assignor to Robertshaw Controls Company
Filed Aug. 20, 1973, Ser. No. 390,039
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



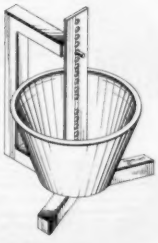
236,883
COMBINED CLOCK AND TIMER
Paul T. Flumm, Oakville, Conn., assignor to Robertshaw Controls Company
Filed Aug. 20, 1973, Ser. No. 390,040
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



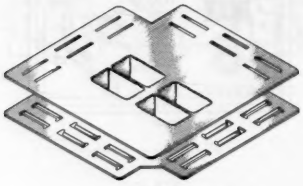
236,884
ELECTRONIC BALANCE
Clyde E. Lotter, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.
Filed Feb. 16, 1973, Ser. No. 333,048
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—87

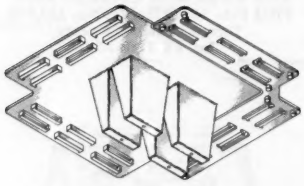


236,885
PROPORTIONAL GRADUATE
Miles W. Wallace, P.O. Box 7473, Boise, Idaho 83707
Filed Feb. 4, 1974, Ser. No. 439,189
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—101

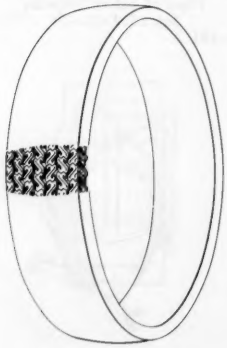


236,886
PALLET
Burton A. Johns, Santa Ana, Calif., assignor to Burton A. Johns, John M. Loechner, and John K. Griff, all of Santa Ana, and Gary J. Griff, Palos Verdes Estates, Calif., fractional part interest to each
Filed Oct. 9, 1973, Ser. No. 404,390
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53

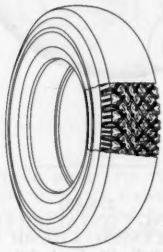




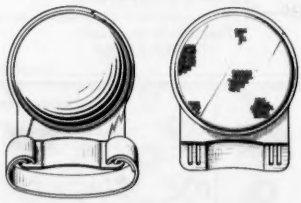
236,887
PNEUMATIC TIRE TREAD AND BUTTRESS
James H. Bierbusse, 435 Cloverly Road, Grosse Pointe Farms, Mich. 48236
Filed Jan. 18, 1974, Ser. No. 434,527
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



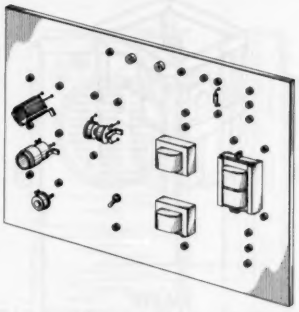
236,888
TIRE
Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Dec. 17, 1973, Ser. No. 425,234
Claims priority, application France June 18, 1973
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



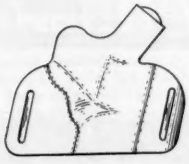
236,889
COMBINED HAND MOUNTED REAR VIEW MIRROR AND REFLECTOR
Albert Sargis, 300 Main St., P.O. Box 118, New Britain, Conn. 06050
Filed Oct. 3, 1974, Ser. No. 511,602
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—189



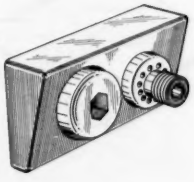
236,890
INDUCTION EDUCATIONAL BOARD
Douglas C. Covert, Royal Oak, Mich., assignor to Xerox Corporation, Stamford, Conn.
Filed July 26, 1973, Ser. No. 383,030
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



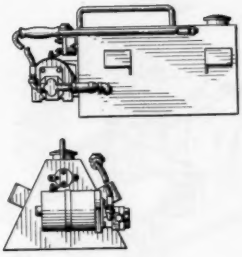
236,891
GUN HOLSTER
Kenneth A. Weissenburger, 46 Leamen Place, Lynbrook, N.Y. 11563
Filed Aug. 22, 1974, Ser. No. 499,657
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



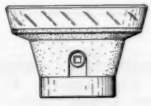
236,892
WALL HYDRANT
Donald E. Carlson, Highland Park, Ill., assignor to Mark Controls Corporation, Evanston, Ill.
Filed Feb. 19, 1974, Ser. No. 443,309
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—12



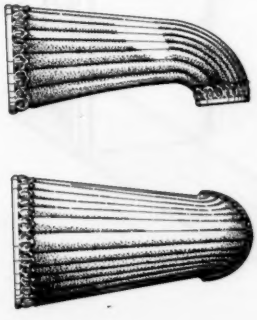
236,893
SPRAYER UNIT
Larry C. Beichle, 2177 Wesley, Salina, Kans. 67401
Filed Apr. 2, 1973, Ser. No. 346,949
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



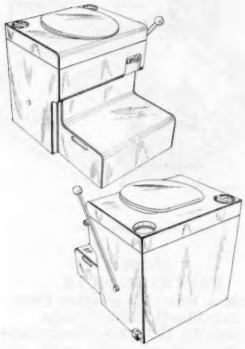
236,894
FAUCET HANDLE
Ronald J. Rice, 241 Overton Place, Oakville, Ontario, Canada
Filed Feb. 22, 1973, Ser. No. 334,636
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



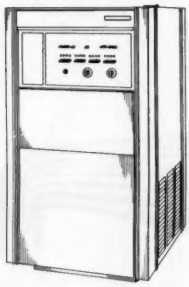
236,895
ORNAMENTAL COVER FOR BATHTUB SPOUT
Ralph La Rue Du Bois, 4242 E. 111th St., Tulsa, Okla. 74136
Filed May 30, 1974, Ser. No. 474,394
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



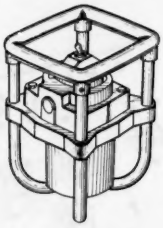
236,896
DRY CLOSET
Peter Nordgren, Gustavsberg, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed Aug. 8, 1974, Ser. No. 495,879
Claims priority, application Sweden Feb. 19, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48



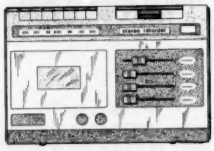
236,897
COMPUTER CABINET
Robert M. Siegel, Los Angeles, F. Gordon Mackay, Tarzana, and James J. Hall, Encino, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 9, 1973, Ser. No. 404,546
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



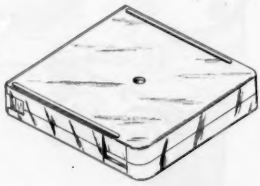
236,898
ELECTRIC MOTOR POWER UNIT OR SIMILAR ARTICLE
Grover P. Holther, Jr., Mount Prospect, Ill., assignor to Racine Federated Inc.
Filed Mar. 4, 1974, Ser. No. 447,502
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A



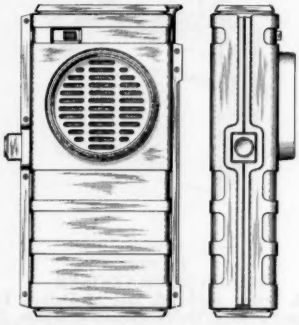
236,899
STEREO CASSETTE TAPE RECORDER CABINET
Peter Emmer, Buchenbronn, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Oct. 12, 1973, Ser. No. 405,989
Term of patent 14 years
Int. Cl. D14—*01; 03*
U.S. Cl. D26—14 B



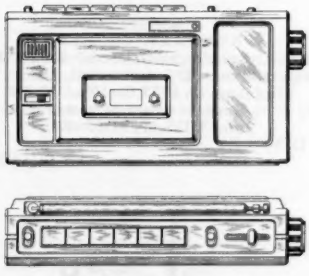
236,900
MAGNETIC TAPE CARTRIDGE
Raymond B. Larsen, Riverview Road, Riverton, Wyo. 82501
Continuation of abandoned design application Ser. No. 26,195, Nov. 27, 1970. This application May 25, 1972, Ser. No. 257,068
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—14 B



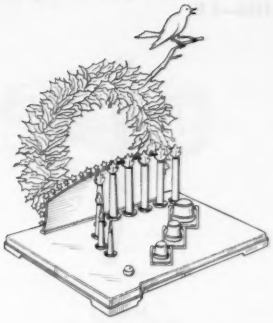
236,901
WALKIE TALKIE
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,509
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K



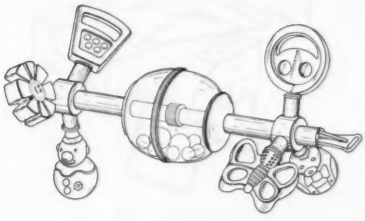
236,902
COMBINED PORTABLE CASSETTE TAPE RECORDER AND FM/AM RECEIVER
Tomoji Okada and Takuro Nakayama, Tokyo, Japan, assignors to General Electric Company, Syracuse, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,510
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 B



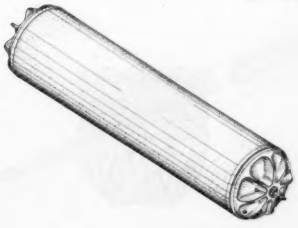
236,903
TABLE DECORATION WITH WREATH
John R. Martindale, R.R. 1, Jordan, Lincoln, Ontario, Canada LOR 1SO
Filed Sept. 4, 1973, Ser. No. 394,376
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 R



236,904
INFANT'S GYM TOY
Paul D. Snyder, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 7, 1974, Ser. No. 431,166
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 J



236,905
BUOYANT AMUSEMENT DEVICE
John F. Hunt, 19207 60th W., Lynnwood, Wash. 98036
Filed Aug. 31, 1973, Ser. No. 393,617
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15.41

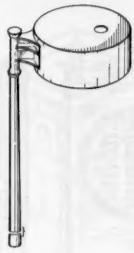


236,906
CULTIVATOR TINE
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10 Weverskade, Maasland, Netherlands
Filed Aug. 5, 1974, Ser. No. 494,965
Claims priority, application Switzerland Feb. 18, 1974
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E

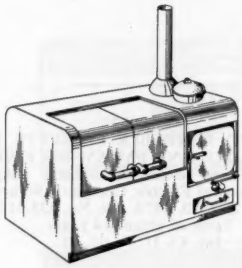
236,907
YARN GUARD FOR STOP MOTION
Morris Saslowsky, East Meadow, N.Y., assignor to Wesco Industries Corporation, Plainview, N.Y.
Filed Apr. 12, 1974, Ser. No. 460,475
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D47—5

236,908
CANDLEHOLDER
Preston J. Frazier, Jr., Houston, Tex., assignor to Faroy, Inc.
Filed Aug. 30, 1973, Ser. No. 393,148
Term of patent 14 years
Int. Cl. D7—*01*; D26—*01*
U.S. Cl. D48—2

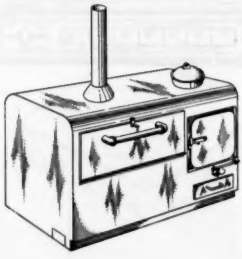
236,909
OUTDOOR LIGHT MOUNTING FIXTURE
Vincent J. Richilano, Lakewood, Ohio, assignor to Zephyr Industries, Inc.
Filed Nov. 14, 1973, Ser. No. 415,826
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



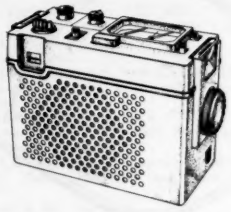
236,910
HAMBURGER COOKER
Herbert J. Oyler, deceased, late of Dallas, Tex., by Margaret Frances Oyler, executrix, Dallas, Tex.
Filed Aug. 13, 1973, Ser. No. 387,852
Term of patent 14 years
Int. Cl. D7—*02*; D15—*08*
U.S. Cl. D55—1 E



236,911
BARBECUE COOKER
Herbert J. Oyler, deceased, late of Dallas, Tex., by Margaret Frances Oyler, executrix, Dallas, Tex.
Filed Aug. 13, 1973, Ser. No. 387,989
Term of patent 14 years
Int. Cl. D7—*02*; D15—*08*
U.S. Cl. D55—1 E

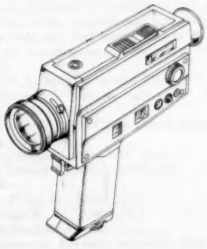


236,912
RADIO RECEIVER
Toshimasa Akazawa, Yao, and Kikuo Ohta, Katano, Japan, assignors to Matsushita Electric Industrial Co., Kadoma, Japan
Filed Oct. 2, 1973, Ser. No. 402,856
Claims priority, application Japan Apr. 11, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

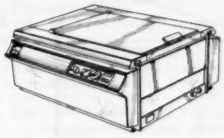


236,913
RADIO RECEIVER
Katsuhiko Makino, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Kadoma, Japan
Filed Jan. 9, 1974, Ser. No. 431,972
Claims priority, application Japan Aug. 14, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

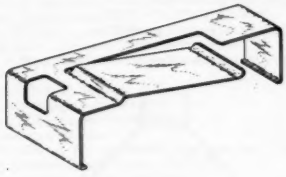
236,914
MOVIE CAMERA
Nobuki Matsumoto, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan
Filed Mar. 4, 1974, Ser. No. 447,635
Claims priority, application Japan Sept. 8, 1973
Term of patent 7 years
Int. Cl. D3—*02*
U.S. Cl. D61—1 C



236,915
ELECTROSTATIC COPIER
Masatoshi Hideshima, Machida-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Oct. 25, 1973, Ser. No. 409,724
Claims priority, application Japan Apr. 30, 1973
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D61—1 Q



236,916
CAMERA CLIP
Maynard Frank Wolfe, 18B Venice Court, 41 Conduit Road, Aberdeen, Hong Kong
Filed Oct. 26, 1973, Ser. No. 410,046
Claims priority, application Great Britain July 16, 1973
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D61—1 E

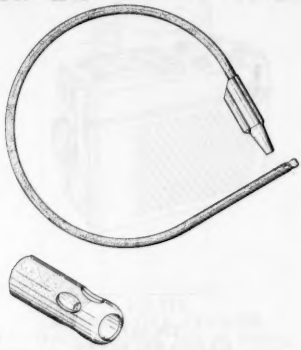


236,917
COMBINED WRITING INSTRUMENT AND CAP THEREFOR
Norman Melnick, Highland Park, N.J., assignor to Magic Marker Corporation, Cherry Hill, N.J.
Filed Apr. 2, 1973, Ser. No. 347,212
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

236,918
MEDICAL LIQUID BOTTLE
Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Feb. 26, 1974, Ser. No. 445,848
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 U

236,919
BOTTLE FOR MEDICAL LIQUID
Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Feb. 26, 1974, Ser. No. 445,847
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 U

236,920
CATHETER
David S. Sheridan, Argyle, N.Y., assignor to National Catheter Corporation, Argyle, N.Y.
Continuation-in-part of abandoned design application Ser. No. 455,927, Mar. 28, 1974. This application Aug. 19, 1974, Ser. No. 498,591
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—12 A



236,921
WINE PRESS
Urban J. Louis, Springfield, Ill., assignor to Gloria D. Louis, Springfield, Ill.
Filed Aug. 28, 1973, Ser. No. 392,369
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—2

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF SEPTEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Netteland, Loyal G.; and Heintz, Clifford E., 3,906,945.

AB Bahco Verktyg: *See—*
Brunosson, Bengt Bruno, 3,906,631.

AB Bofors: *See—*
Hakansson, Christer Lennart, 3,907,880.

Abbott, Clyde H. Tie rod with expansible cone seal members. 3,907,244, Cl. 249-40.000.

Abbott Laboratories: *See—*
Biel, John Hans; and Klundt, Irwin L., 3,907,864.
Inaba, Makoto; Bernstein, Edith; and Garmaise, David Lyon, 3,907,889.
Knox, Kenneth Howard, 3,906,958.
Von Esch, Anne Mary; and Crovetti, Aldo Joseph, 3,907,809.

Abe, Mitsuhiro: *See—*
Tanaka, Shigeo; Hashimoto, Kazuyoshi; Takatsu, Toshiharu; Abe, Mitsuhiro; Sada, Hidetaki; and Kawanami, Katsusuke, 3,906,767.

Aberdeen Industries, Inc.: *See—*
Lowenthal, Walter S., Jr., 3,906,655.

Abex Corporation: *See—*
Adams, Cecil E.; and Dillon, Leo H., 3,906,993.

Abitibi Paper Company Ltd.: *See—*
Gunning, John R., 3,908,044.

Abraham, Howard E.; Bodway, George E.; and Jackson, Weldon H., to Hewlett-Packard Company. A process of forming metallization structures on semiconductor devices. 3,907,620, Cl. 156-11.000.

Accetta, Anthony F. Methods of killing certain bacteria and fungi and diminishing dental plaque. 3,907,991, Cl. 424-130.000.

ACF Industries, Incorporated: *See—*
Carle, Ross G.; and Powell, Richard G., 3,907,121.

Achener, Claude, to Quartz & Silice, S.A. Method for depositing silica on a fused silica tube. 3,907,536, Cl. 65-60.000.

Acme Highway Products Corporation: *See—*
McLean, Ronald L., 3,907,443.

Adams, Cecil E.; and Dillon, Leo H., to Abex Corporation. Dual direction floating valve seat. 3,906,993, Cl. 137-540.000.

Adcock, Albert W.; and Spector, George. Energy crisis game. 3,907,301, Cl. 273-135.0AB.

Addoms, John F.; Kors, David L.; and Lawver, Billy R., to Aerojet-General Corporation. Exhaust emissions control device. 3,906,725, Cl. 60-307.000.

Addressograph Multigraph Corporation: *See—*
Ervin, James H., 3,907,279.
Sable, Harvey J., 3,907,560.

AEG-Telefunken-Teldec: *See—*
Paul, Bruno; Wilisch, Jurgen; Wimmer, Gunter; and Richter, Volker, 3,907,305.

Aeritalia S.p.A.: *See—*
Stearns, Gabriel E., 3,907,224.

Aerojet-General Corporation: *See—*
Addoms, John F.; Kors, David L.; and Lawver, Billy R., 3,906,725.
Beighley, Clair M.; Demuth, Orin J.; and Froelich, Richard W., 3,906,719.
Boydston, William M., 3,906,720.

Aeroquip A.G.: *See—*
Viennot, Pierre, 3,907,955.

Affa, Stephen N., to General Connectors Corporation. Angularly adjustable duct connector. 3,907,337, Cl. 285-114.000.

Agafonov, Igor Danilovich: *See—*
Shepovalov, Vyacheslav Dmitrievich; Federov, Alexandr Vasilievich; Puzankov, Anatoly Grigorievich; Khmyrov, Viktor Alexeevich; Delokas, Eduard Petrovich; Agafonov, Igor Danilovich; Bataev, Evgeny Ivanovich; and Khabatov, Boris Shugaibovich, 3,907,112.

Agfa-Gevaert Aktiengesellschaft: *See—*
Eppe, Rudolf; Schnall, Gunther; Schott, Walter; Bronner, Hermann; and Ettelbruck, Rudiger, 3,907,422.
Weber, Klaus; Hell, August; and Schneider, Horst, 3,907,110.

Agnew, James Malcolm; and James, Granville Collis, to Coal Industry (Patents) Ltd. Apparatus for inducing air flow. 3,907,208, Cl. 239-428.500.

Ahrendt, Donald A.; and Finlayson, Thomas J., to Allis-Chalmers Corporation. Operator's station optionally stationary or elevated. 3,907,141, Cl. 214-701.00P.

Aileo, Jackson A., to Gentex Corporation. Headset retainer for helmet. 3,906,547, Cl. 2-6.000.

Air Preheater Company, Inc., The: *See—*
Mahoney, Robert Emmett, 3,906,606.

Airco, Inc.: *See—*
Critchlow, Philip R., 3,907,550.
Spies, George R., Jr., 3,907,263.

Aisan Kogyo Kabushiki Kaisha: *See—*
Tateno, Hidenori; Konishi, Masami; Arai, Hisaharu; and Koeda, Kenji, 3,907,943.

Aisin Seiki Kabushiki Kaisha: *See—*
Arai, Fuminao, 3,906,906.
Kagata, Tooru, 3,906,812.

Aizawa, Tatsuo: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,907,567.

Ajax Hardware Corporation: *See—*
Gorton, Howard B.; Read, George D.; and Ridgway, Keith E., 3,907,350.

Ajinomoto Co., Inc.: *See—*
Uzuki, Teruo; Takahashi, Mayumi; Noda, Misa; Komachiya, Yoshioki; and Wakamatsu, Hachiro, 3,907,638.

Akashi, Shunji: *See—*
Takahashi, Kihei; and Akashi, Shunji, 3,906,594.

Akers, Robert F., to Datagage Systems, Inc. Manometer level detector. 3,908,129, Cl. 250-577.000.

Akiyoshi, Katsumi: *See—*
Yamaguchi, Ikutoshi; Terui, Yukimasa; and Akiyoshi, Katsumi, 3,907,004.

Aktiebolaget Electrolux: *See—*
Mattsson, Bo Gunnar, 3,906,585.

Aktiebolaget Platmanufaktur: *See—*
Jonsson, Bo Ragnar; Toll, Gunnar Georg; and Bodelind, Bo Torsten Krister, 3,907,534.

Aktiengesellschaft Gebruder Loepfe: *See—*
Eichenberger, Werner; Lapp, Karl; Loepfe, Erich; and Stutz, Hansruedi, 3,907,440.

Aktiengesellschaft "Weser": *See—*
Lucht, Wilhelm, 3,906,879.

Akutsu, Mitsuo: *See—*
Minagawa, Motonobu; Akutsu, Mitsuo; and Nakagawa, Kenichi, 3,907,517.

Alberti, John, to Boeing Company, The. Retractable cargo restraint and center guide for cargo compartments. 3,906,870, Cl. 105-464.000.

Albrecht, Hermann Friedrich, to Rollei-Werke Franke & Heidecke. Process and apparatus to facilitate cutting motion picture film with magnetic sound track. 3,907,411, Cl. 352-5.000.

Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis-basic ketones of fluoranthene. 3,907,791, Cl. 260-246.00B.

Alembik, Alfred. Piece of furniture for sitting and lying. 3,906,558, Cl. 5-29.000.

Alfa Romeo, S.p.A.: *See—*
Garcea, Giampaolo, 3,906,722.
Garcea, Giampaolo, 3,906,909.

Alfred, Lawrence W.: *See—*
Smith, William W.; and Alfred, Lawrence W., 3,906,580.

Allegheny Ludlum Industries, Inc.: *See—*
Hartline, Albert G., III, 3,907,551.

Allen, Otis H., Sr.: *See—*
Routh, Herman M.; and Allen, Otis H., Sr., 3,906,750.

Allen, Robert P.: *See—*
Holmes, Jerry D.; Allen, Robert P.; and Dawes, John L., 3,907,829.

Allgemeine Industrie Commerz, Walter Von Weizenbeck: *See—*
Mayer, Friedrich, 3,907,377.

Allianz-Technik AG: *See—*
Elger, Gerd, 3,906,886.

Allied Chemical Corporation: *See—*
Feder, Raymond L.; Fuhrmann, Robert; Pisanchyn, John; Elisheswitz, Saul; Insinger, Thomas H.; and Mathew, Chempolil Thomas, 3,907,901.
Nienart, Louis F.; Saunders, Ralph R.; and Jeges, Paul, 3,908,038.

Allis-Chalmers Corporation: *See—*
Ahrendt, Donald A.; and Finlayson, Thomas J., 3,907,141.
Gilmore, Thomas P., 3,908,163.
Kreitzberg, Ernest A., 3,906,817.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Collin, Per Harald, 3,908,072.
Wrammerfors, Per, 3,906,770.

Allway Tools Inc.: *See—*
Gringer, Donald, 3,906,625.

Alterman, David S.; and Chun, Kil Whan, to Lever Brothers Company. Encapsulation process for particles. 3,908,045, Cl. 427-213.000.

Aluminum Company of America: *See—*
Wheeler, William R., 3,907,953.

Amalga Corporation: *See—*
Harmon, Emerson R., 3,907,149.

Amchem Products, Inc.: *See—*
Weidenbenner, William A.; and Steltz, Irvin J., 3,908,064.

Amelio, Armand Francis, to United Aircraft Corporation. Rear engine redundant mount. 3,907,220, Cl. 244-54.000.

Amemiya, Kunio: *See—*
Arimoto, Heiji; Goto, Tokuji; Amemiya, Kunio; and Seki, Tunekatu, 3,906,757.

American Air Filter Company, Inc.: *See*—
Onnen, James H., 3,907,527.
American Bank Note Company: *See*—
D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,907,274.
American Chain & Cable Company, Inc.: *See*—
Knudsen, Kenneth F., 3,906,867.
American Coldset Corporation: *See*—
Thompson, Charles T.; Kidd, Frank B.; and Diamond, Lawrence W., 3,907,047.
American Cyanamid Company: *See*—
Blank, Werner Josef, 3,907,740.
Capozza, Richard Carl, 3,907,677.
Cross, Barrington; and Walworth, Bryant Leonidas, 3,907,825.
Garber, Murray, 3,907,824.
Haacke, Gottfried C., 3,907,716.
Levy, Stephen David; Poeschel, Gordon Paul; and Scrider, Michael Stanley, 3,907,936.
Loffelman, Frank Fred; and Brady, Thomas Eugene, 3,907,698.
Murdock, Keith Chadwick; and Herndon, Robert Alton, 3,907,817.
Whitman, Robert Henry; and Lento, Louis Leonard, Jr., 3,907,964.
American Flange & Manufacturing Co., Inc.: *See*—
Jesevich, John; and Simkus, Vyto, 3,907,154.
American Gas Association, Inc.: *See*—
Pangborn, Jon B., 3,907,980.
American Home Products Corporation: *See*—
Hersh, Marvin, 3,908,003.
Nudelman, Abraham, 3,907,788.
Teller, Daniel M.; and Sellstedt, John H., 3,907,787.
Wei, Peter H. L., 3,907,789.
American Medical Electronics Corporation: *See*—
Turner, Robert Bruce, 3,906,797.
American Optical Corporation: *See*—
Cannon, Robert L., 3,906,959.
Wallace, Robert A.; and Pejchar, Jan, 3,906,953.
American Standard, Inc.: *See*—
Parkison, Richard G., 3,906,983.
Amerind-MacKissic, Inc.: *See*—
MacKissic, Albert E.; and Kolb, Robert C., 3,907,216.
Amerock Corporation: *See*—
Van Klompenburg, Marlo, 3,907,346.
Amidon, Alan B.; Mammino, Joseph; and Ferguson, Robert M. Liquid developer. 3,907,695, Cl. 252-62.100.
Amos, Lynn G.; Bacus, James W.; Beaty, Robert C.; and Rogers, Charles H., to Corning Glass Works. Blood smeared slide centrifuge. 3,906,890, Cl. 118-6.000.
AMP Incorporated: *See*—
Huber, John Henry, 3,907,396.
Ampex Corporation: *See*—
Wolf, Irving W.; and Carpenter, William E., 3,907,116.
Anazawa, Shinzo; and Kuroda, Toshiro, to Nippon Electric Company Limited. Ceramic substrate assembly for electronic circuits having ceramic films thereon for intercepting the flow of brazing agents. 3,908,184, Cl. 357-72.000.
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; and Sando, Shigeru, to Nippon Electric Company Limited. Packaged semiconductor device for microwave use. 3,908,186, Cl. 357-80.000.
Andera, Joseph F.: *See*—
Stumpf, Joseph G.; and Andera, Joseph F., 3,907,339.
Anderson, Arnold L., to Michigan Chemical Corporation. Polyester plastic compositions containing bis-phenoxy flame retardants. 3,907,744, Cl. 260-45.90R.
Anderson Development Company: *See*—
Meyer, Jeffrey G., 3,907,849.
Anderson, Raymond H., to Minnesota Mining and Manufacturing Company. Optically decorative web. 3,908,056, Cl. 428-142.000.
Anderson, Robert R.: *See*—
Smith, William W.; and Alfred, Lawrence W., 3,906,580.
Andreassen, Knut Anton; and Stiansen, Kjell Bjorn, to Norsk Hydro A.S. Method for the molten salt electrolytic production of metals from metal chlorides and electrolyzer for carrying out the method. 3,907,651, Cl. 204-70.000.
Andrieu, Jean-Louis; Bonnet, Yves; and Verdeau, Jean-Jacques, to Commissariat a l'Energie Atomique. Steam generator. 3,906,905, Cl. 122-32.000.
Angevine, Peter Allen: *See*—
Roberts, Elliott J.; and Angevine, Peter Allen, 3,907,674.
Angliss, Ian Bruce; and Guise, Geoffrey Bruce, to Commonwealth Scientific and Industrial Research Organization. Heat treating apparatus and process. 3,906,562, Cl. 8-149.100.
Anton, William J. E.; Collins, John E.; and Lind, Peter A., to Minnesota Mining and Manufacturing Company. Control circuit having load and power source isolation. 3,908,131, Cl. 307-12.000.
Antonini, Albert; Joffre, Philippe; and Laine, Francois, to Produits Chimiques Pechiney-Saint-Gobain. Fluid bed oxychlorination of ethylene. 3,907,912, Cl. 260-659.00A.
Antus, Sandor: *See*—
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andreas; Farkas, Lorant; Antus, Sandor; and Kovacs, Maria, 3,907,830.
Anzai, Nobuo; and Kamaike, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Induction motor speed control apparatus. 3,908,156, Cl. 318-203.00R.
Anzai, Norio; Tomozawa, Akihiro; Tsunematsu, Masayasu; and Matsui, Yasushi, to Hitachi, Ltd. Method of producing multi-layer structure. 3,906,620, Cl. 29-571.000.
Aoki, Hisashi: *See*—
Fujino, Masahiko; Wakimasu, Mitsuhiro; Nakajima, Nobuo; and Aoki, Hisashi, 3,907,766.
Appleman, William S., to Richmond Manufacturing Company, The. Horizontal boring machine with remote pump control system. 3,907,043, Cl. 173-163.000.
Application des Gaz: *See*—
Schaller, Pierre Andre, 3,907,490.
Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, to Fuji Photo Film Co., Ltd. Magenta coupler-containing silver halide photographic materials. 3,907,571, Cl. 96-100.000.
Arai, Fuminao, to Aisin Seiki Kabushiki Kaisha. Rotary piston engine. 3,906,906, Cl. 123-8.130.
Arai, Hisaharu: *See*—
Tateno, Hidenori; Konishi, Masami; Arai, Hisaharu; and Koeda, Kenji, 3,907,943.
Arai, Tomio; Fukui, Suguru; Morimoto, Tatsuo; Kitazato, Hajime; and Yokoyama, Tohru, to Chiyoda Kako Kensetsu Kabushiki Kaisha. Process for producing metal containing composition. 3,907,715, Cl. 252-465.000.
Aramaki, Kuninori; Kawakami, Hiroshi; and Suzuki, Masao, to Bridgestone Tire Company Limited. Belt device for collecting floating matter from water surface. 3,907,685, Cl. 210-242.000.
Arant, Gene W. Pivot joint having at least four degrees of freedom. 3,907,444, Cl. 403-77.000.
Archibald, John Leheup: *See*—
Cavalla, John Frederick; and Archibald, John Leheup, 3,907,810.
Argoudelis, Alexander D.; Coats, John H.; and Johnson, LeRoy E., to Upjohn Company, The. Celestosaminide antibiotic derivatives. 3,907,774, Cl. 260-210.00R.
Argoudelis, Alexander D.; and Johnson, LeRoy E., to Upjohn Company, The. Antibiotics zervacin I and zervacin II and process for preparing the same. 3,907,990, Cl. 424-119.000.
Argus Chemical Corporation: *See*—
Minagawa, Motonobu; Akutsu, Mitsuo; and Nakagawa, Kenichi, 3,907,517.
Arima, Hideki: *See*—
Murakami, Masuo; Kubo, Kazuo; Arima, Hideki; and Sano, Kenji, 3,907,879.
Arimoto, Heiji; Goto, Tokuji; Amemiya, Kunio; and Seki, Tunekatu, to Unitika Ltd. Apparatus for continuous dyeing of yarns. 3,906,757, Cl. 68-20.000.
Arkharov, Alexei Mikhailovich; Romanenko, Nikolai Trofimovich; Nikitin, Jury Filippovich; and Litenkova, Ljudmila Anatolievna. Device for locking an actuating element. 3,907,447, Cl. 403-316.000.
Arlac-Werk Heiko Ippen: *See*—
Halm, Hans, 3,907,159.
Arluck, Elmer M., to Yardney Company. Orthopedic device. 3,906,943, Cl. 128-90.000.
Armco GmbH: *See*—
Poter, Hans; and Schroder, Christian, 3,906,696.
Armco Steel Corporation: *See*—
Fitz, Joe C., 3,906,773.
Armour Pharmaceutical Company: *See*—
Hughes, John Lawrence; and Liu, Robert Chung-Huan, 3,908,013.
Armour, Roland L.; and Shriver, Seymour L. Composite dental resin filling instrument. 3,906,637, Cl. 32-60.000.
Armstrong Cork Company: *See*—
Burkey, David J.; Mason, William L.; and Olcott, Robert S., Jr., 3,907,729.
Otthofer, Jacob A., Jr., 3,907,622.
Armstrong, George W. Enclosed lock gate valve. 3,907,178, Cl. 222-504.000.
Arndt, Friedrich: *See*—
Puttner, Reinhold; and Arndt, Friedrich, 3,907,861.
Arnold, William O., to Union Insulating Company. Protector device. 3,906,586, Cl. 16-2.000.
Arntson, Gary L.; and Connell, Lehman J., to General Motors Corporation. Occupant knee restraint. 3,907,326, Cl. 280-150.00B.
Aronson, Theodore, to Para-Medical Instrument Corporation. Blood pressure cuff and bladder and apparatus embodying the same. 3,906,937, Cl. 128-2.05C.
Aronson, Theodore, to Para-Medical Instrument Corporation. Blood pressure measuring means. 3,906,939, Cl. 128-2.05G.
Arvin Industries, Inc.: *See*—
Cauldwell, Jack D., 3,908,165.
Asahi Denka Kogyo K.K.: *See*—
Nakazawa, Masahiko; Nakamura, Shizuo; and Nakayama, Mutumi, 3,907,063.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nonaka, Kohhei; Miura, Hitoshi; and Fukushima, Masayoshi, 3,906,802.
Shimojima, Yukiji; Mizuno, Yukiko; Horiguchi, Sadayuki; Mizuno, Masayuki; Ohoka, Tadaaki; and Takeda, Isao, deceased, 3,907,989.
Asai, Komei: *See*—
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, 3,907,405.
Asano, Tsuneo: *See*—
Kakinuma, Atsushi; Kanamaru, Tsuneo; Sugino, Hiromu; Asano, Tsuneo; and Yoneda, Masahiko, 3,907,764.

Aschermann, Wilfried; and Bockelmann, Paul, to U.S. Philips Corporation. Circuit arrangement for influencing frequency response by electronic means, in particular electronic tone control circuit. 3,908,172, Cl. 330-29.000.

Ascon Corporation: *See—*
Cason, George C., Jr., 3,908,153.

Ashland Oil, Inc.: *See—*
Robin, Michael; and Schulte, Sheldon R., 3,907,939.

Asik, Joseph R.; and Hanabusa, Mitsugu, to Ford Motor Company. Capacitor discharge ignition system with controlled spark duration. 3,906,919, Cl. 123-148.00E.

Aspel, Thomas E. Method of marking archwire with tooth width measurements. 3,906,634, Cl. 32-14.00C.

Atkinson, James L.; and Boltinghouse, Joseph C., to Rockwell International Corporation. Speed control for an electrostatically supported ball gyroscope. 3,906,804, Cl. 74-5.700.

Atkiss, Thomas Clifford; and Kirn, William August, to Pennwalt Corporation. Preanneal rinse process for inhibiting pin point rust. 3,907,612, Cl. 148-18.000.

Atlantic Richfield Company: *See—*
Grane, Henry R., 3,907,902.
Yoo, Jin Sun, 3,907,923.

Audi Nsu Auto Union Aktiengesellschaft: *See—*
Pozelt, Martin; Uebelstadt, Manfred; Duhn, Ahlrich; and Bauer, Karl, 3,907,351.

Auer, John H., Jr.: *See—*
Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., 3,907,238.

Auerbach, Sidney; and Lovitz, Alfred, Jr., to Object Recognition Systems, Inc. Method and apparatus for digital recognition of objects particularly biological materials. 3,908,078, Cl. 178-6.800.

Augat, Inc.: *See—*
Damon, Neil F., 3,907,397.

Auge, Wolfgang: *See—*
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 3,907,838.

Augspurger, Lynn Lawrence. Processes for reproduction of cellular bodies. 3,906,929, Cl. 128-1.000.

Auh, Chung M.: *See—*
Malcosky, Norman D.; McLean, Ronald H.; Singh, Kanwal N.; and Auh, Chung M., 3,907,025.

Austin, Keith L.; and Morris, Harper K. Key trap. 3,906,762, Cl. 70-390.000.

Automated Manufacturing Systems, Inc.: *See—*
Campbell, Robert L., Jr.; and Smith, Hal Lee, 3,906,615.

Automobiles Peugeot: *See—*
Basseet, Robert Auguste, 3,907,682.

Autoplex Corporation: *See—*
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Avco Corporation: *See—*
Fischer, Joerg, 3,907,417.
Kasmarik, Joseph R.; and Hoffmann, Ambros S., 3,907,386.

Avery Products Corporation: *See—*
Bolduc, William J., Jr., 3,907,557.

Ayerst, McKenna & Harrison, Ltd.: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 3,907,998.

Ayr King Corporation: *See—*
King, Donald E., 3,907,525.

Ayres, Waldemar A., to Becton, Dickinson and Company. Needle point for stopper penetration and method of making it. 3,906,932, Cl. 128-2.00F.

B A Installationsutveckling AB: *See—*
Persson, Bengt Arne, 3,907,249.

B. F. Goodrich Company, The: *See—*
Jones, Richard A., 3,907,730.
Smith, Philip A.; and Setser, Ronald H., 3,907,081.
Tedeschi, Edward T., Jr., 3,906,732.

B. Heller and Co.: *See—*
Wistreich, Hugo E.; Thundiyil, George J.; and Juhn, Hyunil, 3,908,031.

Babbitt, Albert B., to Premier Engineering Company, Inc. Beam transfer mechanism. 3,907,098, Cl. 198-218.000.

Babcock & Wilcox Company, The: *See—*
Seidel, William B., 3,906,681.

Babcock, William C.: *See—*
Burtis, Wilson A.; and Babcock, William C., 3,907,010.

Bablitzka, Adolf, to Knorr-Bremse GmbH. Pressure-medium operated relay valve for the control of brakes on a vehicle. 3,907,381, Cl. 303-40.000.

Backlund, Sture Olof Erik. Method of performing a surge-boil step during the heating period of a lignocellulosic material cooking stage. 3,907,631, Cl. 162-42.000.

Bacso, Imre; and Galantay, Eugene E., to Sandoz Inc. 3-Oximino-17α-propadienyl-substituted-4,9-gonadienes. 3,907,844, Cl. 260-397.500.

Bacus, James W.: *See—*
Amos, Lynn G.; Bacus, James W.; Beaty, Robert C.; and Rogers, Charles H., 3,906,890.

Bader, Jorg, deceased; and by Bader-Ludwig, Dagmar, legal representative, to Ciba-Geigy Corporation. Pyridazonylphosphoric acid derivatives as herbicides. 3,907,541, Cl. 71-86.000.

Bader-Ludwig, Dagmar, legal representative: *See—*
Bader, Jorg, deceased; and Bader-Ludwig, Dagmar, legal representative, 3,907,541.

Badger, Joe G.; and Valdettaro, Alarico A., to Sarkes Tarzian, Inc. Driving mechanism for driving internally mounted indicators containing fine tune driving mechanism. 3,906,805, Cl. 74-10.540.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Dehnert, Johannes; and Lamm, Gunther, 3,907,769.
Effenberger, Franz; Bantel, Karl-Heinz; and Eilingsfeld, Heinz, 3,907,837.
Liebold, Gert; Oppenlaender, Knut; Buettner, Egon; Fikentscher, Rolf; and Mohr, Rudolf, 3,907,701.
Marx, Matthias; and Storck, Gerhard, 3,907,737.
Marx, Matthias; Dimroth, Peter; Batzill, Wolfgang; and Miksovsky, Felix, 3,907,756.

Baehr, Edward F.; Esgar, Jack B.; and McGannon, William J., to United States of America, General Counsel-Code GP. Ophthalmic liquifaction pump. 3,906,954, Cl. 128-305.000.

Baffas, George J. Lined pipe and method of making same. 3,907,049, Cl. 138-155.000.

Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna & Harrison, Ltd. Methods for relieving bronchial spasm with 9,15-dioxygenated prostanoic and prost-13-enoic acids and the like. 3,907,998, Cl. 424-318.000.

Bahr, Agnes K. Blanket and sheet. 3,906,559, Cl. 5-334.00C.

Bahr, Melford J.: *See—*
Beck, Charles C.; and Bahr, Melford J., 3,906,705.

Baigas, Joseph F., Jr. Separating device. 3,907,671, Cl. 209-144.000.

Bailey, Philip S.: *See—*
Chang, Yun Ger; and Bailey, Philip S., 3,907,903.

Baker, Arthur D., Jr., to Sioux Steam Cleaner Corporation. Rotating locking wrench holder. 3,907,269, Cl. 269-55.000.

Baker, Richard H.; and Clawson, Robert C., to Steelcase Inc. Upholstery system. 3,907,363, Cl. 297-445.000.

Baker, William R.: *See—*
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Balata, Fabrizio: *See—*
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Baldelli, Riccardo. City and/or district transport line. 3,906,863, Cl. 104-88.000.

Baldwin, Lisle L.: *See—*
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Baldwin, Willett F., to Mobil Oil Corporation. Particulate material detection means. 3,906,780, Cl. 73-61.00R.

Ballhause, Helmut: *See—*
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Baltimore Aircoil Company, Inc.: *See—*
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Barabas, Andrew A., to Castro Convertible Corporation. Drop in sofa bed. 3,906,557, Cl. 5-13.000.

Barash, David: *See—*
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Bard, Bernard D., to Creatron Industries, Inc. Plastic wheel construction for utility vehicles. 3,907,370, Cl. 301-63.00R.

Bard, Donald I. Portable needlecraft support. 3,906,648, Cl. 38-102.200.

Barenyi, Bela; and Renner, Hermann, to Daimler-Benz Aktiengesellschaft. Door for passenger motor vehicles. 3,907,358, Cl. 296-146.000.

Barker, Roger M.: *See—*
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Barkow, Werner T. W. Process and apparatus for production of hexachlorobenzene. 3,907,910, Cl. 260-650.00R.

Barnes, Ronald B., to Du Pont de Nemours, E. I., and Company. Circuit socket and removable package. 3,907,394, Cl. 339-65.000.

Barrett, Leo Donald; and Malkin, Irving, to Diamond Shamrock Corporation. Coated metal and method. 3,907,608, Cl. 148-6.200.

Barry Wright Corporation: *See—*
Moriarty, Frederic J., 3,907,390.

Bartenstein, Michael F., to Vermont Marble Company. Arrangement for guiding press rams. 3,907,385, Cl. 308-6.00C.

Barth, Gerald Dean; and Wagner, David Prugh, to Illinois Tool Works Inc. Method and apparatus for assembling a screw and compressible washer. 3,906,567, Cl. 10-155.00A.

Barton, Edward B.: *See—*
Jordan, William E.; Barton, Edward B.; Fiske, Kenton W.; and Swanson, Roger M., 3,907,421.

Barton, Kenneth R.; and Vachon, Raymond N., to Eastman Kodak Company. Finishing agents for textiles. 3,907,736, Cl. 260-29.40R.

Basco, Imre; and Galantay, Eugene E., to Sandoz Inc. 3-Oximino-17α-propadienyl-substituted-4-gonenes. 3,907,845, Cl. 260-397.500.

BASF Wyandotte Corporation: *See—*
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Basseet, Robert Auguste, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Purification of industrial waste water. 3,907,682, Cl. 210-114.000.

Bassignani, Anthony L. Material measuring and dispensing device. 3,907,166, Cl. 222-42.000.

Bataev, Evgeny Ivanovich: *See—*
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Bates, Hamilton C., Jr., to C. J. Bates & Son, Inc. Hoop for embroidery and the like. 3,906,647, Cl. 38-102.200.

Bates, Wayne C.; and Moore, Richard L., to Truth Incorporated. Security lock. 3,907,348, Cl. 292-220.000.

Battelle Memorial Institute: *See—*
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Batzill, Wolfgang: *See—*
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Bawa, Jaspal S., to Thomas & Betts Corporation. Pliers-type hand tool with attached insulation slitting blade. 3,906,561, Cl. 7-5.400.

Baxter Laboratories, Inc.: *See—*
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BBC Brown Boveri & Company Limited: *See—*
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Beach, Sidney C.; and Martin, Bernard P., to McGean Chemical Co., Inc. Symmetrical acetylenic sulfo-oxygen compounds. 3,907,876, Cl. 260-513.00R.

Beall, Glenn Lee; and White, Fred K., to Miles Laboratories, Inc. Selectively detachable apparatus. 3,907,505, Cl. 23-259.000.

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Bear Manufacturing Corporation: *See—*
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Beattie, David Anthony, to Imperial Chemical Industries Limited. Locking device. 3,907,157, Cl. 220-327.000.

Beaty, Robert C.: *See—*
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Becker, Joseph J., to Firmenich S.A. Process for preparing lactones. 3,907,831, Cl. 260-345.200.

Becker, Maureen E.: *See—*
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Becker, Otto Alfred. Electroplating of the cut edges of sheet metal panels. 3,907,649, Cl. 204-15.000.

Becton, Dickinson and Company: *See—*
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Bednarczyk, Edward A.; Spaulding, Robert A.; and Trible, Clayton J., to General Motors Corporation. Dual fuel system and method. 3,906,915, Cl. 123-127.000.

Beekmans, Nicolaas Marinus: *See—*
Heijne, Leopold; Beekmans, Nicolaas Marinus; Poolman, Petrus Jacobus; and Eijnthoven, Ronald Karel, 3,907,657.

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Behringer, Cecil; and Kamin, George J., to GTE Sylvania Incorporated. Method of preventing braze and diffusion flow. 3,906,617, Cl. 228-118.000.

Beighley, Clair M.; Demuth, Orin J.; and Froelich, Richard W., to Aerojet-General Corporation. Rocket having movable secondary nozzle. 3,906,719, Cl. 60-225.000.

Bejed, Inc.: *See—*
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Belk, Thomas E.; Blecharczyk, Stephen S.; and Shunney, Edward L., to Fram Corporation. Treating waste. 3,907,673, Cl. 210-17.000.

Bell Telephone Laboratories, Incorporated: *See—*
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Bellati, Hans; and Muhlhauser, Helmut, to BBC Brown Boveri & Company Limited. Labyrinth seal with blocking medium. 3,906,730, Cl. 60-657.000.

Belli, Richard. Multi-pose shade, blind and curtain support system. 3,907,240, Cl. 248-254.000.

Beloit Corporation: *See—*
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Bendall, Dennis M.; Harris, William R.; Kew, Jeffrey; Sherborne, Michael C.; and Jones, John A., to Rank Xerox Ltd. Flexible sheet handling device. 3,907,280, Cl. 271-174.000.

Bendix Corporation, The: *See—*
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Benfield Corporation, The: *See—*
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Benimetzki, Eliezer. Riveter having axially latchable clutch. 3,906,775, Cl. 72-391.000.

Bennett, Gene Lee, to Genio Tools, Inc. Cutting tool holder. 3,907,453, Cl. 408-199.000.

Bennett, Richard J.; Gray, Lew T.; and Levy, Dale F., to Phillips Petroleum Company. Stabilizing open graded asphalt-concrete. 3,907,449, Cl. 404-75.000.

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Berg, William R. Junction box back and support. 3,908,074, Cl. 174-58.000.

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Bergeson, Richard P., to Maytag Company, The. Dishwasher. 3,906,967, Cl. 134-104.000.

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Bergum, Bernard C., to ESB Incorporated. Electrochemical cell and safety resistor therefor. 3,907,588, Cl. 136-6.00R.

Beringer-Hydraulik GmbH.: *See—*
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Berlied, Henry P., Jr., to Dovre Ski Binding, Inc. Toepiece for cross-country skiing. 3,907,319, Cl. 280-11.35B.

Bernard, Raoul, to Regie Autonome des Transports Parisiens. Track and method of laying track on a concrete road bed. 3,907,200, Cl. 238-7.000.

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Bernstein, Benjamin: *See—*
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Bernstein, Edith: *See—*
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Bersani, Franco. Rotating optical wedge device. 3,907,432, Cl. 356-138.000.

Bertram, August Herman; and Gill, Stephen Harold, to Caterpillar Tractor Company. Gauge modifier for an excavator. 3,907,055, Cl. 180-9.480.

Berve, Jurgen: *See*—
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Biasotti, Joseph Brian; and Oberender, Frederick G., to Texaco Inc. Motor fuel composition. 3,907,516, Cl. 44-58.000.
Bickerdike, Robert Lewis; and Hughes, Garyth, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Majesty's Government of the. Carbon articles. 3,907,950, Cl. 264-29.000.
Bickmore, John T., to Xerox Corporation. Image developing techniques. 3,908,037, Cl. 427-14.000.
Biel, John Hans; and Klundt, Irwin L., to Abbott Laboratories. Amino acid esters and amides of disubstituted phenethylamines. 3,907,864, Cl. 260-471.00C.
Bingmann, Waldemar, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for continuously measuring the resistance of track rails to lateral pressures. 3,906,789, Cl. 73-146.000.
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Bittle, David F.; and McPeters, Arnold L., to Monsanto Company. Method of applying a dye liquor to a tow. 3,907,498, Cl. 8-177.00R.
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Boaden, Kenneth Joseph; and Edmondson, Brian John. Additive for steel baths. 3,907,554, Cl. 75-129.000.
Boardman, Harold; and Wagner, Richard L., to Hercules Incorporated. Preparing lithographic plates utilizing hydrolyzable mercapto-silane compounds. 3,907,564, Cl. 96-33.000.
Bochory, Michael. Separable holder for keys and similar objects. 3,906,763, Cl. 70-456.00R.
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Bolth, Franklin Anderson; Crozier, Ronald David; and Strow, Lawrence Evans, to Minerec Corporation. Dialkyl thionocarbamate method. 3,907,854, Cl. 260-455.00A.
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Bone, Aubra N. Drapery and sheet material cleaning machine. 3,906,756, Cl. 68-18.00F.
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Borbas, Robert A.; and Dufton, John R., to GTE Automatic Electric (Canada) Limited. Fault detection system for a telephone exchange. 3,908,099, Cl. 179-175.20R.
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Bowers, William S., to United States of America, Agriculture. Synthetic hormones for insect control. 3,908,016, Cl. 424-278.000.

Boydston, William M., to Aerojet-General Corporation. Igniter assembly for rocket motors. 3,906,720, Cl. 60-256.000.

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BPB Industries Limited: *See—*
Pilgrim, Thomas Albert; Cuin, David Ernest; Wightman, Colin John; and Donovan, John Leslie, 3,906,695.

Bradley, Wilson E., Jr.; and Schinner, Edward N., to Baltimore Aircoil Company, Inc. Control system for injection cooling towers. 3,907,942, Cl. 261-27.000.

Brady, Thomas Eugene: *See—*
Loffelman, Frank Fred; and Brady, Thomas Eugene, 3,907,698.

Braginsky, Herman. Radio connected alarm system. 3,908,180, Cl. 340-220.000.

Brainard, Edward C., II; and Layport, John L., to Environmental Devices Corporation. Apparatus for measuring fluidic current. 3,906,790, Cl. 73-170.00A.

Bralorne Resources Limited: *See—*
Gray, Gary D., 3,907,048.

Bramfitt, Bruce L.; and Marder, Arnold R., to Bethlehem Steel Corporation. Bainitic ferrous alloy and method. 3,907,614, Cl. 148-36.000.

Bramhall, Dan E., to Fiberglass Engineering Incorporated. Power windshield for boats. 3,906,563, Cl. 9-1.00R.

Brancaccio, Giovanni: *See—*
Viterbo, Rene; Brancaccio, Giovanni; and Perri, Giulio Cesare, 3,907,823.

Brandenburg, Dietrich; and Puls, Walter, to Bayer Aktiengesellschaft. Insulin derivatives crosslinked by a dicarboxylic acid moiety. 3,907,763, Cl. 260-112.700.

Bredsted, Ole Jacobsen: *See—*
Pedersen, Bendt Ove; and Bredsted, Ole Jacobsen, 3,907,460.

Brenner, L. Martin: *See—*
Van Hoeven, Helene E. Bowman; Brenner, L. Martin; and Loev, Bernard, 3,907,814.

Breslow, Jeffrey D., to Marvin Glass and Associates. Competitive projectile game. 3,907,294, Cl. 273-85.00R.

Bretl, Robert: *See—*
Manske, Warren C.; Bretl, Robert; and Strutz, Carlon, 3,906,579.

Bridges, Robert D.: *See—*
Liu, Gordon Y. T.; Smith, Donald R.; and Bridges, Robert D., 3,907,760.

Bridgestone Tire Company Limited: *See—*
Aramaki, Kuninori; Kawakami, Hiroshi; and Suzuki, Masao, 3,907,685.
Fujikawa, Akira; and Hoshino, Takashi, 3,907,018.
Yamaguchi, Ikutoshi; Terui, Yukimasa; and Akiyoshi, Katsumi, 3,907,004.

Brigham, Gerald A.; and Libuha, John J., to United States of America, Navy. Compliant blanket acoustic baffle. 3,907,062, Cl. 181-.500.

Briles Manufacturing, Omark Industries, Precision Fastening Subsidiary: *See—*
Reid, Bruce D., 3,907,442.

Bringman, David J., to Beloit Corporation. Adjustable drain plate in a paper web forming zone. 3,907,635, Cl. 162-211.000.

Brink, Miless L. Method for identifying Bence Jones proteins. 3,907,502, Cl. 23-230.00B.

Brink, Robert H., Jr.: *See—*
Shema, Bernard F.; and Brink, Robert H., Jr., 3,908,030.

Brisse, Andre H.; and Griffiths, David K., to United States Steel Corporation. Method of refining in improved Q-BOP vessel. 3,907,549, Cl. 75-60.000.

Bristol-Myers Company: *See—*
Naito, Takayuki; Okumura, Jun; and Hoshi, Hideaki, 3,907,786.

British Petroleum Company Limited, The: *See—*
Wurzbacher, Frank, 3,906,793.

British Petroleum International Ltd., The: *See—*
Forth, Timothy Frederick, 3,907,917.

Broadbent, Kent D., to MCA Disco-Vision, Inc. Extended play videodisc recording system. 3,908,076, Cl. 178-6.70A.

Broadbent, Kent D., to MCA Disco-Vision, Inc. Method of making an extended play video disc record. 3,908,080, Cl. 178-6.60R.

Brock, Klaus: *See—*
Simons, Willi; Grothe, Horst; Haselhuhn, Rolf; Koenig, Peter; and Brock, Klaus, 3,907,022.

Brodhead, Howard: *See—*
Gwyn, John E.; Baldwin, Lisle L.; and Brodhead, Howard, 3,907,661.

Bronner, Hermann: *See—*
Eppe, Rudolf; Schnall, Gunther; Schott, Walter; Bronner, Hermann; and Ettelbruck, Rudiger, 3,907,422.

Brooks, Eugene H., to Hardwicke-Etter Company. Bulk cargo unloading mechanism. 3,907,133, Cl. 214-44.00B.

Brown, David A. Fuel system. 3,907,946, Cl. 261-142.000.

Brown, Herbert M.: *See—*
Brown, Silas A.; and Brown, Herbert M., 3,907,143.

Brown, Morton; and Prosser, Robert M., to Du Pont de Nemours, E. I., and Company. Blends of thermoplastic copolyetherester with poly-butylene terephthalate. 3,907,926, Cl. 260-860.000.

Brown, Ronald A. S.: *See—*
Jensen, Erik J.; Brown, Ronald A. S.; and Wiggins, Ernest J., 3,906,972.

Brown, Silas A.; and Brown, Herbert M. Front end loader for tractors. 3,907,143, Cl. 214-768.000.

Brown, William R. Sewer laying system. 3,906,737, Cl. 61-72.500.

Broxterman, William E.: *See—*
Heinert, Dietrich H.; and Broxterman, William E., 3,907,872.

Brucher, Peter, to Borsig Gesellschaft mit beschrankter Haftung. Spring-loaded scraper blade holder on scraper shafts of scraper coolers. 3,906,577, Cl. 15-104.10R.

Bruna, Ladislav: *See—*
Budesinsky, Zdenek; Janata, Vladimir; Svab, Alois; Bruna, Ladislav; Capek, Alois; and Simek, Antonin, 3,907,797.

Bruno, Thomas P.; and Finn, Benedict F., to Wood Industries, Inc. High voltage electrode mounting. 3,906,856, Cl. 101-349.000.

Brunosson, Bengt Bruno, to AB Bahco Verktyg. Jaw assembly for bolt cutting devices. 3,906,631, Cl. 30-267.000.

Brunswick Corporation: *See—*
Manning, Robert E., 3,906,627.
Woodfill, William L., 3,906,885.

Bryand, Edward T., to Metal-Tech, Inc. Method for fabricating honeycomb rolls. 3,906,616, Cl. 29-121.00A.

Bryant, Clyde C. Receptacle clamp. 3,907,182, Cl. 224-2.00B.

Bsharah, Lewis; and May, Walter R., to Petrolite Corporation. Antioxidant systems containing chelating agents. 3,907,745, Cl. 260-45.9AA.

Bucalo, Louis. Implanting structure and method. 3,906,549, Cl. 3-1.500.

Buchel, Karl Heinz; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Tricycloalkyl tin 1,2,4-triazole compounds. 3,907,818, Cl. 260-299.000.

Budesinsky, Zdenek; Janata, Vladimir; Svab, Alois; Bruna, Ladislav; Capek, Alois; and Simek, Antonin, to SPOFA, United Pharmaceutical Works. 5-(3-Iodinepropargyloxy)pyrimidines. 3,907,797, Cl. 260-251.00R.

Buehler Ltd.: *See—*
Roth, Kurt H., 3,906,678.

Buehler, Walter E.; and Lunden, Clarence D. Airborne radar instrument landing system. 3,908,189, Cl. 343-5.0LS.

Buescher, William E.; and Kerstetter, Donald R., to GTE Sylvania Incorporated. Method of fabricating a fast warm-up picture tube cathode system. 3,906,601, Cl. 29-25.140.

Buettner, Egon: *See—*
Liebold, Gert; Oppenlaender, Knut; Buettner, Egon; Fikentscher, Rolf; and Mohr, Rudolf, 3,907,701.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,907,840.

Bugg, William S.: *See—*
Schenk, Stanley A.; and Bugg, William S., 3,906,556.

Buhler, Frederick T., to Philco-Ford Corporation (Now Aeronutronic Ford Corporation). Hybrid video amplifier. 3,908,170, Cl. 330-3.000.

Bukin, Vasily Nikolaevich; and Garkina, Irina Nikolaevna. Method of producing calcium pangamate. 3,907,869, Cl. 260-482.00R.

Bulloch, Carl Gordon, Jr. Spring cushion construction and method of forming same. 3,906,560, Cl. 5-354.000.

Buncher, Bernard R., to Westinghouse Electric Corporation. Adjustable stator ring. 3,908,143, Cl. 310-260.000.

Bunker Ramo Corporation, The: *See—*
Kwan, Okun; and Masi, James Vincent, 3,907,092.

Buono, Joseph. Latching device. 3,906,815, Cl. 74-527.000.

Burdeska, Kurt, to Ciba-Geigy Corporation. Process for the manufacture of tetraaryloxybenzoquinones. 3,907,839, Cl. 260-396.00R.

Bures, Jiri; and Fic, Vojtech, to Zbrojovka Brno, narodni podnik. Protective coatings on metals and on their alloys. 3,907,613, Cl. 148-31.500.

Burge, Donald G.; and McPhillips, Norris J., to Parker-Hannifin Corporation. Tube coupling. 3,907,335, Cl. 285-23.000.

Burgess Industries Incorporated: *See—*
Halter, Edmund John, 3,907,528.

Burgos, D. Jose Soto. Coiled resilient ball and paddle. 3,907,296, Cl. 273-95.00R.

Burke, James E., to VCA Corporation. Adaptor fitting for blowing up inflatable devices. 3,907,012, Cl. 141-349.000.

Burke, Vincent D.; and Johnson, Kendrick A. Anti-coagulant bait package for rodents including methods of making and using same. 3,906,656, Cl. 43-131.000.

Burkey, David J.; Mason, William L.; and Olcott, Robert S., Jr., to Armstrong Cork Company. Short fiber reinforced spindle drive wheel. 3,907,729, Cl. 260-17.200.

Burnstine, Murray. Aids for the visually handicapped. 3,906,971, Cl. 135-47.000.

Burroughs Corporation: *See—*
Black, Dewie E.; Fabry, Donald F.; and Dombrowski, Thaddeus, 3,906,785.

Burrous, Merwyn L., to Chevron Research Company. Erosion-inhibited functional fluids. 3,907,697, Cl. 252-75.000.

Burtis, Wilson A.; and Babcock, William C. Anti-pollution service station assembly. 3,907,010, Cl. 141-45.000.

Burton, Albert C.; McGraw, William E.; and Savino, Thomas V., to Cahs, Inc. Motor vehicle theft-prevention apparatus. 3,907,060, Cl. 180-114.000.

Burton, Bernard Lee; Takaki, Minoru; and Hall, Roger D., to Bendix Corporation, The. Process for manufacturing domed spiral antennas. 3,907,565, Cl. 96-36.200.

Burton, Parsons and Company, Inc.: *See*—
Rankin, Billy F., 3,907,985.

Burton, Perry E. Hemming method and apparatus. 3,906,878, Cl. 112-423.000.

Burton, Willard J. Mine ventilation door. 3,906,670, Cl. 49-381.000.

Burzen, Norman J., to Nordon Industries, Inc. Apparatus for sensing the passage of coins through and the retention of coins in a coin handling mechanism. 3,907,088, Cl. 194-9.00R.

Buske, Walter E., to United Merchants and Manufacturers, Inc. Applicator for self-adhesive sheet material. 3,907,628, Cl. 156-574.000.

Butler, John E. Chess set. 3,907,302, Cl. 273-136.00E.

Butler, Louis L., to Bear Manufacturing Corporation. Apparatus for balancing rotating bodies. 3,906,801, Cl. 73-457.000.

Butti, Adriano; and Prino, Giuseppe, to Crinos Industria Farmacobiologica S.p.A. Pharmaceutical compositions containing salts of sulfoglycopeptides with aminoacids. 3,907,992, Cl. 424-177.000.

Byrne, Joseph B.; and Ledbetter, Harvey D., to Dow Chemical Company, The. Composite materials comprising resin matrix and carbon fibers. 3,908,061, Cl. 428-288.000.

C. G. Manufacturing Co.: *See*—
Ehrlich, Harold P., 3,907,239.

C. J. Bates & Son, Inc.: *See*—
Bates, Hamilton C., Jr., 3,906,647.

C. L. (Basingstoke) Limited: *See*—
Kitching, John Metcalfe, 3,908,004.

Cable Climber Safety Devices, Incorporated: *See*—
McElroy, Robert, 3,907,255.

Cabot Corporation: *See*—
Gardner, Ross, Jr., 3,907,731.

Cahs, Inc.: *See*—
Burton, Albert C.; McGraw, William E.; and Savino, Thomas V., 3,907,060.

Calame, Jean-Pierre; Kappeler, Heinrich; and Oberhansli, Peter, to Givaudan Corporation. Process for preparation of cyclopentenones. 3,907,896, Cl. 260-586.00C.

Calgon Corporation: *See*—
Guilbault, Lawrence James; and Hoffstadt, Frederick Alan, 3,907,891.
Guilbault, Lawrence James, 3,907,927.

California Institute of Technology: *See*—
Micka, Ernest Z., 3,908,118.
Rupe, Jack H., 3,906,913.

California Linear Circuits, Inc.: *See*—
Ennis, Robert M., Jr., 3,908,183.

Calvert, Anthony J.; Collingwood, Eric C.; and Johnston, Richard, to Gillette Company, The. Hair holding compositions containing a water-insoluble block copolymer. 3,907,984, Cl. 424-47.000.

Campbell, Kenneth B.: *See*—
Schwing, Charles E.; and Campbell, Kenneth B., 3,906,759.

Campbell, Robert L., Jr.; and Smith, Hal Lee, to Automated Manufacturing Systems, Inc. Method for feeding and driving tacks. 3,906,615, Cl. 29-432.000.

Canadian Patents and Development Limited: *See*—
Pask, Glen S., 3,906,710.
Wilson, Michael R., 3,907,987.

Canale, Raymond P., to General Motors Corporation. Internal combustion rotary engine with internal exhaust gas recirculation. 3,906,907, Cl. 123-8.130.

Canale, Raymond P., to General Motors Corporation. Rotary combustion engine oil seal. 3,907,466, Cl. 418-75.000.

Cannon, Robert L., to American Optical Corporation. Liquid leak stop for an implantable heart pacer. 3,906,959, Cl. 128-419.00P.

Canon Kabushiki Kaisha: *See*—
Inoue, Eiichi; Shimizu, Isamu; Sakuma, Hiraku; and Kokado, Hiroshi, 3,907,566.
Komori, Shigehiro; and Katayama, Hajime, 3,907,424.
Sone, Yoshiaki; and Ueno, Fumio, 3,907,415.
Uchidoi, Masanori; and Yamada, Tateo, 3,907,414.

Cantatore, Giuseppe: *See*—
Bonvicini, Alberto; Cantatore, Giuseppe; and Balata, Fabrizio, 3,907,935.

Capek, Alois: *See*—
Budesinsky, Zdenek; Janata, Vladimir; Svab, Alois; Bruna, Ladislav; Capek, Alois; and Simek, Antonin, 3,907,797.

Capka, Martin; Svoboda, Petr; Hetflejs, Jiri; Bazant, Vladimir; Bazant, Petr; Bazantova, Vera; and Bazant, Jan, to Ceskoslovenska akademie ved. Method of producing unsaturated organosilicon compounds. 3,907,850, Cl. 260-448.20E.

Caplan, Harry W. Solar-thermal power system employing adjustable curvature reflective panels and method of adjusting reflective panel curvature. 3,906,927, Cl. 126-270.000.

Capone, Angelo W. Racing type horseshoe. 3,907,036, Cl. 168-26.000.

Capozza, Richard Carl, to American Cyanamid Company. Regular alternating copolymers of styrene and imidazolines and their derivatives. 3,907,677, Cl. 210-54.000.

Carabateas, Philip M.: *See*—
Lesher, George Y.; and Carabateas, Philip M., 3,907,808.

Carbone, Theodore, to Process Controls. Control apparatus for gasoline dispensing pump. 3,907,165, Cl. 222-16.000.

Carbonoyl Company: *See*—
Metzger, Grant W., 3,907,134.

Carborundum Company, The: *See*—
Close, Sam, 3,907,688.
Morse, David V., 3,907,491.

Cargowall Limited: *See*—
Csumrik, Joseph D., 3,906,871.

Carl Manufacturing Company Ltd.: *See*—
Inoue, Toshio, 3,906,633.

Carle, Ross G.; and Powell, Richard G., to ACF Industries, Incorporated. Force transmitting means for a railway car cushioning device. 3,907,121, Cl. 213-8.000.

Carlson, Randolph S., to Lear Motors Corporation. Control system for vapor engines. 3,906,731, Cl. 60-665.000.

Carlson, Ronald H.; and Mesiah, Raymond N., to FMC Corporation. Treatment of chlorinated isocyanurate waste streams. 3,907,794, Cl. 260-248.00A.

Carlson, William G., to Westinghouse Electric Corporation. Method of making tubular polycrystalline oxide body with tapered ends. 3,907,949, Cl. 264-6.000.

Carmichael, Paul D.: *See*—
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,906,734.

Carothers, William F. Spear guide mechanism for use in multiple tubing well casings. 3,907,355, Cl. 294-86.100.

Carpenter, William E.: *See*—
Wolf, Irving W.; and Carpenter, William E., 3,907,116.

Carr, George J., to Teledyne Sprague Engineering, a division of Teledyne, Inc. Hydro-pneumatic flexible bladder accumulator. 3,907,000, Cl. 138-30.000.

Carrow, Guy E., to Phillips Petroleum Company. Flexible cylinder for cooling an extruded pipe. 3,907,961, Cl. 264-314.000.

Cartmell, James H.: *See*—
Rowell, Lorne A.; and Cartmell, James H., 3,906,961.

Carver, Bobby C., to Eastman Kodak Company. Textile treating composition and textile yarn treated therewith. 3,907,689, Cl. 252-8.700.

Cashen, Norton A.: *See*—
Reinhardt, Robert M.; Kullman, Russell M. H.; Cashen, Norton A.; and Reid, John D., 3,907,497.

Cashin Systems Corporation: *See*—
Spooner, Robert J., 3,906,823.

Cason, George C., Jr., to Ascon Corporation. Ground clip for semiconductor package. 3,908,153, Cl. 317-2.00R.

Castro Convertible Corporation: *See*—
Barabas, Andrew A., 3,906,557.

Caterpillar Tractor Company: *See*—
Bertram, August Herman; and Gill, Stephen Harold, 3,907,055.
Bianchetta, Donald L.; Lohbauer, Kenneth R.; and Rhodes, Sammy J., 3,906,840.
Chappell, Charles J.; and Klett, Gene R., 3,906,613.
Cheek, Michael Edward, 3,907,070.
Connor, Donald H.; and McCornack, John C., 3,906,729.
Downen, Ronald L.; and Hicks, Leon E., 3,906,835.
Engel, Simon L., 3,907,408.
Gianessi, Albert; and Wirt, Leon Arnold, 3,907,333.
Griffiths, Edward, 3,907,309.
Kessinger, Orville E., Jr., 3,907,382.
Lavish, Ronald E., 3,907,054.
Schexnayder, Lawrence F., 3,906,839.
Shelby, Robert L., 3,907,383.
Webber, Philip S.; Franz, Maurice F.; and Moline, Kenneth R., 3,906,813.

Cathers, William P., to PPG Industries, Inc. Lead edge stop device. 3,907,128, Cl. 214-6.00D.

Cathers, William P.: *See*—
Bollinger, Dwight A.; Cathers, William P.; and Koontz, Harry S., 3,907,127.
Bollinger, Dwight A.; and Cathers, William P., 3,907,587.

Cauldwell, Jack D., to Arvin Industries, Inc. Field strength meter. 3,908,165, Cl. 324-77.00A.

Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. 1-Imidazolylalkylene-piperidines. 3,907,810, Cl. 260-293.700.

Caveney, Jack E.; and Moody, Roy A., to Panduit Corporation. Integral cable tie. 3,906,593, Cl. 24-16.0PB.

Cedar Falls Corporation: *See*—
Roberts, Frank D., 3,906,891.

Celanese Corporation: *See*—
Slinkard, William E.; and Hughes, Michael P., 3,907,833.
Stautzenberger, Adin Lee, 3,907,972.

Central Glass Company, Limited: *See*—
Suzuki, Toshihiro, 3,907,185.

Central Telephone S.A.: *See*—
Deluegue, Andre, 3,908,094.

Certain-teed Products Corporation: *See*—
Pretot, Monique, 3,907,723.

Ceskoslovenska akademie ved: *See*—
Capka, Martin; Svoboda, Petr; Hetflejs, Jiri; Bazant, Vladimir; Bazant, Petr; Bazantova, Vera; and Bazant, Jan, 3,907,850.

Chadwick, Stanley Vincent, to General Motors Corporation. Telescopic shock absorber and dust shield. 3,907,080, Cl. 188-322.000.

Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., to Mobil Oil Corporation. Conversion of carbonyl compounds to aromatics. 3,907,915, Cl. 260-668.00R.

Chang, Robert C. C., to Sun Oil Company of Pennsylvania. Heat shield for temperature sensors. 3,907,605, Cl. 136-233.000.

Chang, Yun Ger; and Bailey, Philip S., to Reichhold Chemicals, Inc. Organic peroxides. 3,907,903, Cl. 260-610.00R.

Chapin, Donald W., to Garrett Corporation, The. Electro-fluidic/hydrofluidic transducer. 3,906,979, Cl. 137-83.000.

Chapman, Arthur S., to Hughes Aircraft Company. Viscous fluid damper. 3,907,079, Cl. 188-290.000.

Chapman, John H.; and Fishlock, Ronald Christopher, to Hovermarine Transport Limited. Gas-cushion vehicles. 3,907,061, Cl. 180-117.000.

Chappell, Charles J.; and Klett, Gene R., to Caterpillar Tractor Company. Method of installing a push-pull coupling on a scraper vehicle. 3,906,613, Cl. 29-426.000.

Chapurlat, Robert; Nicolas, Louis; and Dick, Richard, to Rhone-Poulenc S.A. Semi-permeable polyvinyl alcohol membranes. 3,907,675, Cl. 210-23.000.

Charland, Terrence D.; and Klett, Stanley D., to Xerox Corporation. Magnetic brush developing apparatus. 3,906,898, Cl. 118-637.000.

Charles, Robert: *See—*
Boucheron, Bernard; Charles, Robert; and Gosset, Emile, 3,907,761.

Charneck, Joseph P. Skies. 3,907,315, Cl. 280-11.13S.

Charneck, Joseph P. Ski trainer. 3,907,320, Cl. 280-11.37E.

Charron, Louis Donald; and Stevenson, David Alexander, to Northern Electric Company Limited. Wire insertion tool. 3,906,608, Cl. 29-203.0HC.

Chatterjee, Barun Kumar: *See—*
Ksienysk, Klaus; and Chatterjee, Barun Kumar, 3,907,122.

Cheek, Michael Edward, to Caterpillar Tractor Company. Lubricating apparatus for excavator brake assembly and swing assembly and swing transmission. 3,907,070, Cl. 184-6.130.

Chemiebau Dr. A. Zieren GmbH & Co. KG: *See—*
Jenniges, Ernst, 3,907,979.

Chemische Werke Huls Aktiengesellschaft: *See—*
List, Ferdinand; and Wember, Kurt, 3,907,709.

Chemsoil Corporation: *See—*
Collins, Dwight D., 3,907,510.

Chen, James Ling, to E. R. Squibb & Sons, Inc. Stomal device including means to prolong attachment of flange. 3,906,951, Cl. 128-283.000.

Cheney, Richard F.: *See—*
Port, David J.; and Cheney, Richard F., 3,907,546.

Cherry, David J.: *See—*
Cowell, George K.; and Cherry, David J., 3,907,925.

Chevallier, Daniel Marcel, to Societe Technique et Commercial d'Installations Industrielles "Luceat". Marine loading arm. 3,906,974, Cl. 137-15.000.

Chevaux, Jean, to Roll-Rink S.A. Method for sharpening a skate wheel. 3,907,369, Cl. 301-5.300.

Chevron Research Company: *See—*
Burrous, Merwyn L., 3,907,697.
Kemp, Jacob D., 3,907,913.
King, John M.; and Bakker, Nicolaas, 3,907,691.
Sieg, Robert Paul; and White, Robert James, 3,907,519.

Childs, George William, deceased: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,907,196.

Childs, Patricia M., executrix: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,907,196.

Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT.: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andreas; Farkas, Lorant; Antus, Sandor; and Kovacs, Maria, 3,907,830.

Chiyoda Kako Kensetsu Kabushiki Kaisha: *See—*
Arai, Tomio; Fukui, Suguru; Morimoto, Tatsuo; Kitazato, Hajime; and Yokoyama, Tohru, 3,907,715.

Chladek, Otokar, to Elitex, avody textilniho strojirenstvi, generalni reditelstvi. Apparatus for withdrawing knit work from circular knitting machine. 3,906,751, Cl. 66-149.00S.

Cho, Frederick Y.: *See—*
Hunsinger, Bill J.; Cho, Frederick Y.; and Fugit, Brian B., 3,908,137.

Choay, Jean, to Choay S.A. Therapeutical and cosmetic composition including N-propionyl-epsilon-amino-caproic acid. 3,908,018, Cl. 424-319.000.

Choay S.A.: *See—*
Choay, Jean, 3,908,018.

Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Propynyl benzyl ethers as insecticidal agents. 3,908,000, Cl. 424-341.000.

Christen, Fred F. Shoulder harness. 3,906,944, Cl. 128-133.000.

Christiansen, Claud B.; and Dial, William R., to PPG Industries, Inc. Bleaching cellulosic pulps with gaseous chlorine at a pH of 7 to 10 in a multistage bleaching process. 3,907,632, Cl. 162-66.000.

Christides, Lee S.; and Jensen, Harry L. System for preventing digging machine from damaging underground conduits. 3,907,136, Cl. 214-138.00R.

Christison, Sommerville G.; and Smyth, Michael P., to Gearmatic Company, Ltd. Brake mechanism for winch drums. 3,907,075, Cl. 188-77.00W.

Christman, Robert D.; and Wilson, Geoffrey R., to Gulf Research & Development Company. Hydrodesulfurization of petroleum distillates. 3,907,668, Cl. 208-216.000.

Christy, Marcia E., to Merck & Co., Inc. Substituted dibenzocyclooctene compositions. 3,907,999, Cl. 424-330.000.

Chu, Bing C.; Fischer, David J.; and Kunz, Hans J., to Corning Glass Works. Continuous processing of ribbon material. 3,907,607, Cl. 148-1.500.

Chuang, Vincent T.: *See—*
Boersma, Robert P.; and Chuang, Vincent T., 3,907,851.

Chun, Kil Whan: *See—*
Alterman, David S.; and Chun, Kil Whan, 3,908,045.

Chun, Sun W.; Hamilton, Harry A.; and Montagna, Angelo A., to Gulf Research & Development Company. Hydrocarbon sweetening with a calcined pellet of copper salt and ferric oxide. 3,907,666, Cl. 208-191.000.

Ciba-Geigy AG: *See—*
Luethi, Christian, 3,907,904.
Nachbur, Hermann; Kern, Joerg; and Maeder, Arthur, 3,907,898.

Ciba-Geigy Corporation: *See—*
Bader, Jorg, deceased; and Bader-Ludwig, Dagmar, legal representative, 3,907,541.
Burdeska, Kurt, 3,907,839.
Cowell, George K.; and Cherry, David J., 3,907,925.
Dear, Robert E.; and Tandon, Jai Prakash, 3,907,576.
Dexter, Martin; and Spivack, John D., 3,907,862.
Friedrich, Hans-Helmut; Linhart, Helmut; and Wirth, Hermann O., 3,907,749.
Habermeier, Juergen; and Porret, Daniel, 3,907,719.
Ramey, Chester E.; and Luzzi, John J., 3,907,803.

Cioni, Elisabetta; Cioni, Lucia; and Cioni, Rovena Anichini, widow. Vials feed device along an inclined plane for vials handling machines. 3,907,096, Cl. 198-30.000.

Cioni, Lucia: *See—*
Cioni, Elisabetta; Cioni, Lucia; and Cioni, Rovena Anichini, widow, 3,907,096.

Cioni, Rovena Anichini, widow: *See—*
Cioni, Elisabetta; Cioni, Lucia; and Cioni, Rovena Anichini, widow, 3,907,096.

CITC Industries, Inc.: *See—*
Cohen, William J., 3,906,642.

Citizen Watch Co., Ltd.: *See—*
Suda, Haruo; and Ishida, Fujio, 3,906,713.

Clabburn, Robin James Thomas; and Hill, Frederick William Leslie, to Raychem Corporation. Method of making an electrical connection. 3,906,623, Cl. 29-628.000.

Clark, Peter Frederick, to Xerox Corporation. Corona generating devices. 3,908,127, Cl. 250-325.000.

Clark, Robert P.; Haven, Robert Lee; and Kneidl, Franz A., to Stanley Works, The. Strapping machine. 3,906,851, Cl. 100-4.000.

Clawson, Robert C.: *See—*
Baker, Richard H.; and Clawson, Robert C., 3,907,363.

Cleary, James W.: *See—*
Doss, Richard C.; and Cleary, James W., 3,907,753.

Cleco Industries Ltd.: *See—*
Jinks, David Martin, 3,907,140.

Cleereman, Kenneth J., to Dow Chemical Company, The. Injection molding technique. 3,907,952, Cl. 264-40.000.

Close, Sam, to Carborundum Company, The. Valve for a filter. 3,907,688, Cl. 210-424.000.

Cloyd, Harold S. Syringe. 3,906,947, Cl. 128-237.000.

Clupak, Inc.: *See—*
Heim, Albert; and Groome, Ernest J., 3,908,071.

Coal Industry (Patents) Ltd.: *See—*
Agnew, James Malcolm; and James, Granville Collis, 3,907,208.

Coate Burial Vault, Inc.: *See—*
Yost, Kenneth J., 3,907,679.

Coats, John H.: *See—*
Argoudelis, Alexander D.; Coats, John H.; and Johnson, LeRoy E., 3,907,774.

Cocozza, Salvatore, to I.S.F. S.p.A. Inhaling device for powdered medicaments. 3,906,950, Cl. 128-266.000.

Coffman, Moody L. Illuminating device. 3,906,650, Cl. 40-130.00B.

Coggins, Dolphus Larry, to McDonnell Douglas Corporation. Conversion coating for titanium and titanium base alloys. 3,907,609, Cl. 148-6.200.

Cohen, William J., to CITC Industries, Inc. Combined sport shoe and educational device. 3,906,642, Cl. 35-8.00R.

Coles, Donald K., to Zipcor, Inc. Binaural sight system. 3,907,434, Cl. 356-152.000.

Colgate-Palmolive Company: *See—*
Bauman, Robert Andrew, 3,907,895.
Mostow, John H., 3,907,702.

Collausig, Giampaolo, to Officine Savio, S.p.A. Suction device, able to store yarn, for controlling a source of supply. 3,907,187, Cl. 226-42.000.

Collin, Per Harald, to Allmanna Svenska Elektriska Aktiebolaget. Method and furnace for the melt reduction of metal oxides. 3,908,072, Cl. 13-26.000.

Collingwood, Eric C.: *See—*
Calvert, Anthony J.; Collingwood, Eric C.; and Johnston, Richard, 3,907,984.

Collins, Daniel E.: *See—*
Jackson, Larry L.; Seifert, Walter F.; and Collins, Daniel E., 3,907,696.

Collins, Dwight D., to Chemsoil Corporation. System for burning sulfur and absorbing sulfur dioxide in water. 3,907,510, Cl. 23-278.000.
Collins, John E.: *See—*
Anton, William J. E.; Collins, John E.; and Lind, Peter A., 3,908,131.
Collins, Richard A.: *See—*
Decareau, Alfred J.; and Collins, Richard A., 3,906,568.
Colt Industries Operating Corporation: *See—*
Szlaga, Emil, Jr., 3,906,910.
Columbia Gas System Service Corporation: *See—*
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Combis, Chris: *See—*
Moore, Harry O., 3,907,160.
Combustion Engineering, Inc.: *See—*
Fernandes, John Henry, 3,907,670.
Commissariat a l'Energie Atomique: *See—*
Andrieu, Jean-Louis; Bonnet, Yves; and Verdeau, Jean-Jacques, 3,906,905.
Commonwealth Scientific and Industrial Research Organization: *See—*
Angliss, Ian Bruce; and Guise, Geoffrey Bruce, 3,906,562.
Communications Satellite Corporation (COMSAT): *See—*
Lindmayer, Joseph, 3,907,595.
Compagnie Francaise de Raffinage: *See—*
Scherrer, Claude-Jacques; Mauleon, Jean-Louis; and Gmerek, Jean-Daniel, 3,907,578.
Compagnie Generale des Etablissements Michelin: *See—*
Montagne, Jean Bernard, 3,907,019.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Comptoir Lyon-Alemand-Louyot: *See—*
Lacroix, Roger Claude, 3,907,708.
Compton, William A.; Nachman, Joseph F.; and Seegall, Manfred I., to International Harvester Company. Catalyst for reducing nitrogen oxides. 3,907,714, Cl. 252-462.000.
Computer Devices, Inc.: *See—*
Northfield, William E.; and Novak, Joel S., 3,907,090.
Concast AG: *See—*
Simons, Willi; Grothe, Horst; Haselhuhn, Rolf; Koenig, Peter; and Brock, Klaus, 3,907,022.
Connell, Lehman J.: *See—*
Arntson, Gary L.; and Connell, Lehman J., 3,907,326.
Connor, Donald H.; and McCornack, John C., to Caterpillar Tractor Company. Multiple turbocharger system. 3,906,729, Cl. 60-600.000.
Consolidated Airborne Systems: *See—*
Wallman, Irwin; and Rodger, Erwin S., 3,906,799.
Consolidated Foods Corporation: *See—*
Gaudry, Paul Emile, 3,908,142.
Constructions Navales et Industrielles de la Mediterranee C.N.I.M.: *See—*
Nathan, Guy E.; and Varaud, Claude A., 3,908,190.
Conti, Vincent N., to Dairy Cap Corporation. Cap-tightener. 3,906,706, Cl. 53-331.500.
Continental Can Company, Inc.: *See—*
Fitko, Chester W., 3,908,049.
Frankenberg, Henry E., 3,907,158.
Gor, Vishnu P. J., 3,908,050.
Continental Oil Company: *See—*
Cox, David S., 3,907,906.
Dahl, Herbert Douglas; and Edmond, Tibor O., 3,907,045.
Janssen, Harry Richard; and Lamb, Gerald Donald, 3,907,664.
Leach, Bruce E., 3,907,982.
Radd, Frederick J.; and Oertle, Donald H., 3,907,654.
Starks, Charles M., 3,907,920.
Ziegenhain, William C.; and Smith, John H., 3,907,512.
Cook, Albert W.: *See—*
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Cook, Calvin S.: *See—*
Lohr, Raymond J.; Cook, Calvin S.; Goodwin, Paul G.; and Merl, Carl J., 3,907,331.
Cook, Jerome Emerson, Jr. Sealing item. 3,906,941, Cl. 128-82.000.
Cook, John E., to Norprint Limited. Labelling devices. 3,907,626, Cl. 156-361.000.
Cook, Ormand F.: *See—*
Green, Harry W.; and Cook, Ormand F., 3,906,873.
Cooper-Weymouth, Peterson, Inc.: *See—*
Peterson, Carl G., 3,907,188.
Corning Glass Works: *See—*
Amos, Lynn G.; Bacus, James W.; Beaty, Robert C.; and Rogers, Charles H., 3,906,890.
Chu, Bing C.; Fischer, David J.; and Kunz, Hans J., 3,907,607.
Corrigan, John E.; Dokter, Henry J.; and Ethington, Ambrose, to F. W. Means & Company. Filter system and method. 3,907,681, Cl. 210-75.000.
Corrosion Service Company Limited: *See—*
Watson, Thomas R. B., 3,907,658.
Cotton, Incorporated: *See—*
Ingram, Peter; Jones, Brian W.; Peterlin, Anton; Williams, Joel Lawson; and Woods, Donna Kimes, 3,907,499.
Coulbeck, Maxwell Glover, to M. G. Coulbeck Limited. Stopcocks. 3,907,248, Cl. 251-30.000.
Coulstring, Robert N., to Triangle Engineering, Inc. Bend test machine for weld coupon samples. 3,906,784, Cl. 73-100.000.
Cowell, George K.; and Cherry, David J., to Ciba-Geigy Corporation. Metal deactivators as adhesion promotors for vulcanizable elastomers to metals. 3,907,925, Cl. 260-791.000.
Cox, David S., to Continental Oil Company. Process of recovering alcohols and oil from waste mixtures. 3,907,906, Cl. 260-615.00R.
Cox, Marion E.; and Cox, Mary E. Glove box chamber. 3,907,389, Cl. 312-1.000.
Cox, Mary E.: *See—*
Cox, Marion E.; and Cox, Mary E., 3,907,389.
Cox, Richard D. Portable round bale feeder apparatus. 3,906,901, Cl. 119-58.000.
Craig, James R.; and Villa, Fred J., to United States of America, Eneregy Research and Development Administration. Miniature igniter. 3,906,858, Cl. 102-28.00R.
Craig, James T., to General Motors Corporation. Hydraulic pulsed governor. 3,906,975, Cl. 137-56.000.
Crane, Carl J. Voice-directed aircraft navigation system and direction finder. 3,907,223, Cl. 244-77.00A.
Crane, Grant, to Firestone Tire & Rubber Company, The. Grinding rubber-reinforcing carbonaceous pigment with sulfur. 3,907,583, Cl. 106-307.000.
Crawford, John W. Oscillating power paint brush. 3,906,573, Cl. 15-22.00R.
Creatron Industries, Inc.: *See—*
Bard, Bernard D., 3,907,370.
Crepaco, Inc.: *See—*
Milleson, Joseph P., 3,908,036.
Creusot-Loire Entreprises: *See—*
Bonnaure, Edouard, 3,907,262.
Crinos Industria Farmacobiologica S.p.A.: *See—*
Butti, Adriano; and Prino, Giuseppe, 3,907,992.
Critchlow, Philip R., to Airco, Inc. Method of making same composite billets. 3,907,550, Cl. 75-65.0ZM.
Cronin, Timothy H.; and Richardson, Kenneth, to Pfizer, Inc. Substituted alkyl esters quinoxaline-di-N-oxide-2-carboxylic acid as growth promoting agents. 3,907,994, Cl. 424-250.000.
Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 1,2-Dialkyl-3,5-disubstituted pyrazolium salts and the use thereof as herbicidal agents. 3,907,825, Cl. 260-311.000.
Crossley, John E.: *See—*
Hamilton, C. Robert; Crossley, John E.; Hampton, Thomas W.; and Morris, Kenneth N., 3,906,861.
Crossley, Roger: *See—*
Curran, Adrian Charles Ward; and Crossley, Roger, 3,907,899.
Crossman, Richard L.; Cook, Albert W.; and Hawley, Jesse G., to Goodyear Aerospace Corporation. Key slot segments for driving brake discs. 3,907,076, Cl. 188-218.0XL.
Crouse, Ralph B. Pipe and tube bender. 3,906,778, Cl. 72-459.000.
Crovetti, Aldo Joseph: *See—*
Von Esch, Anne Mary; and Crovetti, Aldo Joseph, 3,907,809.
Crowe, Norman P.: *See—*
Stapp, Willis J.; Crowe, Norman P.; and Molitor, Edwin A., 3,907,129.
Crown Zellerbach Corporation: *See—*
Yonemori, Hayato, 3,907,633.
Crozier, Ronald David: *See—*
Bolth, Franklin Anderson; Crozier, Ronald David; and Strow, Lawrence Evans, 3,907,854.
Crystal, Richard G., to Xerox Corporation. Process for preparing waterless lithographic masters. 3,907,562, Cl. 96-1.800.
Csumrik, Joseph D., to Cargowall Limited. Dunnage member retaining assembly. 3,906,871, Cl. 105-475.000.
Cuin, David Ernest: *See—*
Pilgrim, Thomas Albert; Cuin, David Ernest; Wightman, Colin John; and Donovan, John Leslie, 3,906,695.
Culberson, Donald E.: *See—*
Rainey, William A.; and Culberson, Donald E., 3,906,636.
Cullen, Ernest; Meindl, Peter; Tuppy, Hans; and Bodo, Gerhard, to Boehringer Ingelheim GmbH; and Dr. Karl Thomae GmbH. 3,6-Bis-(aminoacylamino)-acridines. 3,907,804, Cl. 260-279.00R.
Cummins Engine Company, Inc.: *See—*
Harker, Harry E., 3,906,923.
Cunningham, Ernest Ray, to Grip-Pak, Inc. Apparatus for assembling carriers to containers. 3,906,704, Cl. 53-48.000.
Curran, Adrian Charles Ward; and Crossley, Roger, to John Wyeth & Brother Limited. Novel thiols and disulphides. 3,907,899, Cl. 260-609.00D.
Currey, John E.: *See—*
Emery, Alvin T.; Evans, Lee G.; and Currey, John E., 3,907,391.
Currie, Robert Marion; Measamer, Shubert Gernt; and Miller, Donald Nelson, to Du Pont de Nemours, E. I., and Company. Polyester waste recovery. 3,907,868, Cl. 260-475.00D.
Curtis, Gary Martin, to Illinois Tool Works Inc. Tension-responsive fastener drive system. 3,906,819, Cl. 81-52.40R.
Curtis, Gary Martin, to Illinois Tool Works Inc. Container spouts and strainers. 3,907,172, Cl. 222-189.000.
Cutler, Earl F., to Cutler Repaving, Inc. Scarifier for use with asphalt concrete roadway refinishing apparatus. 3,907,450, Cl. 404-90.000.
Cutler-Hammer, Inc.: *See—*
Hults, Harold W., 3,908,108.
Cutler Repaving, Inc.: *See—*
Cutler, Earl F., 3,907,450.
Cycle-Drive Corporation: *See—*
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Cyclone Seeder Company, Inc., The: *See—*
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Cypro Incorporated: *See—*
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Cywinski, Norbert Francis: *See—*
Lo, Ching-tsan; Miller, Joe Jed; and Cywinski, Norbert Francis, 3,907,919.

Czarnowski, Anzelm A. Artist's horse. 3,907,360, Cl. 297-156.000.

Daenen, Robert H. C. M.; and De Coster, Pieter K. J., to Dart Industries, Inc. Multi-unit flora display assembly. 3,906,666, Cl. 47-34.130.

Dahl, Herbert Douglas; and Edmond, Tibor O., to Continental Oil Company. Guidance system for a horizontal drilling apparatus. 3,907,045, Cl. 175-45.000.

Dahn, Ahlrich: *See—*
Pozelt, Martin; Uebelstadt, Manfred; Dahn, Ahlrich; and Bauer, Karl, 3,907,351.

Daimler-Benz Aktiengesellschaft: *See—*
Barenyi, Bela; and Renner, Hermann, 3,907,358.
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Zaiser, Wolfgang; and Hainmuller, Sigurd, 3,906,808.

Dairy Cap Corporation: *See—*
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Daishin Kogyo K.K.: *See—*
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Daisuzu Meriyasu Kogyo Kabushiki Kaisha: *See—*
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Daiwa Boseki Kabushiki Kaisha: *See—*
Miyazaki, Tsutomu; Kato, Takashi; Suzuki, Yoshihisa; Yoshizawa, Toshio; and Ueda, Shozo, 3,906,712.

Dall'Asta, Gino; and Meneghini, Pietro, to Montecatini Edison S.p.A. High impact compositions of PVC and chlorinated polyalkenamers. 3,907,934, Cl. 260-899.000.

Dalton, Clarence T. Post office board game. 3,907,300, Cl. 273-134.0AD.

D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., to American Bank Note Company. Sheet delivery apparatus for printing presses including double stacker. 3,907,274, Cl. 271-64.000.

Damm, Frederick C., to United States of America, Air Force. Radial flow gas dynamic laser. 3,908,175, Cl. 331-94.50G.

Damon, Neil F., to Augat, Inc. High density connector plug assembly. 3,907,397, Cl. 339-107.000.

Dana Corporation: *See—*
Haines, Charles W., 3,906,746.

Dane, Ernest Blaney, Jr. Stratified charge engine. 3,906,922, Cl. 123-190.00B.

Danfoss A/S: *See—*
Jensen, Kurt Baasch; Valbjorn, Knud Vagn; and Dyhr-Mikkelsen, Poul Christian, 3,906,981.
Romer, Bendt Wegge; and Pedersen, Hans Kristian, 3,906,603.

Dankel, Douglas D., to Roper Corporation. Bagging attachment for shredder-bagger. 3,907,214, Cl. 241-79.000.

Danne, Ulrich; and Roters, Friedrich, to Volkswagenwerk Aktiengesellschaft. Device for the control of the liquid level in a receptacle. 3,908,107, Cl. 200-84.00R.

Dannenmann, John E., Jr.: *See—*
Johnson, Bill E.; and Dannenmann, John E., Jr., 3,908,178.

Darnell, William R.: *See—*
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Dart Industries, Inc.: *See—*
Daenen, Robert H. C. M.; and De Coster, Pieter K. J., 3,906,666.

Datagage Systems, Inc.: *See—*
Akers, Robert F., 3,908,129.

Dauksys, Richard J., to United States of America, Air Force. Method of encapsulation. 3,908,040, Cl. 427-58.000.

Davenport, Larry C.; Layne, Harold W.; and Schwaner, Jon M., to Inland Container Corporation. Polygonal container. 3,907,194, Cl. 229-23.0BT.

Davidson, James R., to Xerox Corporation. Development apparatus. 3,906,897, Cl. 118-637.000.

Davis, Delles T.; and Motlong, Bruce D., to Development Research, Ltd. Mobile station for delivery of petroleum products. 3,907,168, Cl. 222-76.000.

Davis, John Buckley. Method and apparatus for breaking and training animals. 3,906,708, Cl. 54-71.000.

Davis, Kenneth E.; and Shim, Kyung S., to Stauffer Chemical Company. Process of manufacturing nitrilotriacetonitrile. 3,907,858, Cl. 260-465.50A.

Davis, William F., Jr. Van step well construction. 3,907,357, Cl. 296-146.000.

Dawes, John L.: *See—*
Holmes, Jerry D.; Allen, Robert P.; and Dawes, John L., 3,907,829.

Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, to Lilly Industries, Ltd. Preparation of substituted decenoic acids. 3,907,846, Cl. 260-408.000.

Day, Charles C. Dirt control shield for an air outlet. 3,906,846, Cl. 98-40.00D.

De Rotterdamsche Droogdok Maatschappij B.V.: *See—*
Swart, Walter, 3,907,636.

De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See—*
De Boer, Edward-Tjitze Onno, 3,908,176.

De Angelis, Gerald George; and Hess, Hans-Jurgen Ernst, to Pfizer, Inc. Arylpyrimidines-inhibitors of platelet aggregation and bronchodilators. 3,908,012, Cl. 424-251.000.

Dear, Robert E.; and Tandon, Jai Prakash, to Ciba-Geigy Corporation. Compositions containing werner complexes of chromium and fluorinated carboxylic acids. 3,907,576, Cl. 106-2.000.

DeBoer, Clarence; and Bannister, Brian, to Upjohn Company, The. Process for producing the antibiotic U-44,590. 3,907,643, Cl. 195-80.00R.

DeBoer, Clarence; and Bannister, Brian, to Upjohn Company, The. 5,6 Dihydro-5-azathymidine and derivatives. 3,907,779, Cl. 260-211.50R.

De Boer, Edward-Tjitze Onno, to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Galvanic isolator for a frequency range of 40 to 900 MHZ. 3,908,176, Cl. 333-24.00C.

Decareau, Alfred J.; and Collins, Richard A., to USM Corporation. Band wiping mechanism for shoe lasting machine. 3,906,568, Cl. 12-7.500.

Decision Data Computer Corporation: *See—*
Hunter, Alexander, 3,907,282.

Decker, Herbert, to Triumph Werke Nurnberg A.G. Ribbon feeding and reversing mechanism. 3,907,094, Cl. 197-162.000.

De Coster, Pieter K. J.: *See—*
Daenen, Robert H. C. M.; and De Coster, Pieter K. J., 3,906,666.

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Defibrator AB: *See—*
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DeGroote, Raymond S.; and Fernandes, Joseph F., to United Aircraft Products, Inc. Tube and fin heat exchanger. 3,907,032, Cl. 165-166.000.

Dehnert, Johannes; and Lamm, Gunther, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Azo compounds containing a 2,6-diaminopyridine coupler component. 3,907,769, Cl. 260-156.000.

de Jerphanion, Louis-Gabriel; and Schlumberger, Etienne, to Societe a Responsabilite Limitee: Societe Francaise de Stockage Geologique"GEOSTOCK". Method for underground storage of heavy flowable substances. 3,906,973, Cl. 137-13.000.

Dellinger, Larry Dean, to Technical Equipment Company of Gastonia, Inc. Core transfer apparatus. 3,906,597, Cl. 28-1.00R.

Delokas, Eduard Petrovich: *See—*
Shepovalov, Vyacheslav Dmitrievich; Federov, Alexandr Vasilievich; Puzankov, Anatoly Grigorievich; Khmyrov, Viktor Alexeevich; Delokas, Eduard Petrovich; Agafonov, Igor Danilovich; Bataev, Evgeny Ivanovich; and Khabatov, Boris Shugaibovich, 3,907,112.

Delong, Donald C.; Lively, David H.; and Neuss, Norbert, to Eli Lilly and Company. Antibiotic complex A 21101 and process for producing same. 3,907,988, Cl. 424-115.000.

Delorme, Pierre Claude Marcel; and Fournier, Yves, to Pont-A-Mousson S.A. Die head for an extruder. 3,907,484, Cl. 425-467.000.

De Luca, Hector F.; Schnoes, Heinrich K.; and Lam, Hing-Yat, to Wisconsin Alumni Research Foundation. 1α-Hydroxyergocalciferol and processes for preparing same. 3,907,843, Cl. 260-397.200.

Deluegue, Andre, to Central Telephone S.A. Telephone transceiver with amplified microphone and speaker. 3,908,094, Cl. 179-81.00B.

Demendi, Joseph F., to Pure Carbon Company, Inc. Aluminum carbon composite seal material. 3,907,514, Cl. 29-191.200.

de Mets, Albert, to Bison-werke Bahre and Greten GmbH and Co. KG. Continuous presses. 3,907,473, Cl. 425-141.000.

Demmering, Gunther, to Henkel & Cie GmbH. Processes for preparation and use of N-alkylpiperazines. 3,907,802, Cl. 260-268.0SY.

Demoute, Jean-Pierre: *See—*
Hainaut, Daniel; and Demoute, Jean-Pierre, 3,908,015.

Demuth, Hans, to Sulzer Brothers Limited. Method of stopping a weaving machine automatically, and a yarn stop motion for performing the method. 3,907,005, Cl. 139-340.000.

Demuth, Orin J.: *See—*
Beighley, Clair M.; Demuth, Orin J.; and Froelich, Richard W., 3,906,719.

Dennis, Richard K., to Du Pont de Nemours, E. I., and Company. Contact post. 3,907,400, Cl. 339-221.00R.

Dennison Manufacturing Company: *See—*
Merser, Francis G., 3,906,611.
Smith, Donald R., 3,907,974.

DePass, Dennis: *See—*
DePass, Dennis M.; and Berger, Bruce, 3,906,996.

DePass, Dennis M.; and Berger, Bruce, to DePass, Dennis. Breathing therapy aid. 3,906,996, Cl. 137-604.000.

DePew, Chester C.: *See—*
Gaines, Clarence F.; and DePew, Chester C., 3,907,325.

Deprima, Anthony E.: *See—*
Fox, Daniel W.; Fox, Robert E.; and Deprima, Anthony E., 3,907,287.

De Rooij, Abraham H.; and Elmendorp, Jan, to Stamicarbon, B.V. Process for recovery of ε-caprolactam from a reaction mixture of ε-caprolactam and sulphuric acid. 3,907,781, Cl. 260-239.30A.

Desaar, Rene. Means for cleaning blowing nozzles in steel production. 3,907,264, Cl. 266-34.0LM.

DesCamp, Victor A.: *See—*
United States of America, National Aeronautics and Space Administration; DesCamp, Victor A.; Boex, Michael W.; Hussey, Michael W.; and Larson, Thomas P., 3,907,686.

de Souza, Antonio, to SCM Corporation. Process for ultraviolet pigmented hardening of pigmented paint films. 3,907,656, Cl. 204-159.160.

Desperques-Volmier, Serge, to Thomson-CSF. Analogue gates. 3,908,136, Cl. 307-251.000.

Deuterium Corporation: *See—*
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Spevack, Jerome S., 3,907,508.
Spevack, Jerome S., 3,907,509.

Deutsche Texaco Aktiengesellschaft: *See—*
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Development Research, Ltd.: *See—*
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De Wilde, Abraham Marinus: *See—*
Luyben, Gijsbertus Cornelius; and De Wilde, Abraham Marinus, 3,906,965.

Dexter, Martin; and Spivack, John D., to Ciba-Geigy Corporation. Hindered phenolic cyano compounds. 3,907,862, Cl. 260-465.00D.

Dhingra, Yog R., to Dow Chemical Company, The. Stable liquid amine salts of chlorinated herbicidal acids. 3,907,545, Cl. 71-113.000.

Dial, William R.: *See—*
Christiansen, Claud B.; and Dial, William R., 3,907,632.

Diamond International Corporation: *See—*
Struble, Glenn E., 3,907,195.

Diamond, Julius, to William H. Rorer, Inc. Cycloalkylbenzaldehydes. 3,907,897, Cl. 260-599.000.

Diamond, Lawrence W.: *See—*
Thompson, Charles T.; Kidd, Frank B.; and Diamond, Lawrence W., 3,907,047.

Diamond Shamrock Corporation: *See—*
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Dick, Richard: *See—*
Chapurlat, Robert; Nicolas, Louis; and Dick, Richard, 3,907,675.

Dickens, Buford T. Jack for repairing car body parts. 3,906,777, Cl. 72-447.000.

Dickore, Karlfried; Draber, Wilfried; and Eue, Ludwig, to Bayer Aktiengesellschaft. 4-Amino-1,2,4-triazine-5-one novel compounds, a process for their production and herbicidal compositions. 3,907,543, Cl. 71-93.000.

Didelot, Pierre; Lasserre, Guy; Letourneau, Georges; and Sudan, Jean Marie, to General Foods France. Process for the continuous manufacture of soft candies. 3,908,032, Cl. 426-660.000.

Didier, Festal: *See—*
Etienne, Szarvasi; Didier, Festal; and Marcel, Grand, 3,907,800.

Diederen, Willi: *See—*
Eberlein, Wolfgang; Heider, Joachim; Diederen, Willi; and Kobinger, Walter, 3,907,776.

Di Leva, Anthony J. Tethered basketball apparatus. 3,907,297, Cl. 273-97.00R.

Dillon, Leo H.: *See—*
Adams, Cecil E.; and Dillon, Leo H., 3,906,993.

Dillon, Thomas J., to FCE-Dillon, Inc. Pre-assembled utility module. 3,906,686, Cl. 52-79.000.

Dimensional Development Corporation: *See—*
Lo, Allen K. W.; and Nims, Jerry C., 3,908,112.

Dimroth, Peter: *See—*
Marx, Matthias; Dimroth, Peter; Batzill, Wolfgang; and Miksovsky, Felix, 3,907,756.

Dinitz, Arthur M. Adjustable bumper including protection against under-ride. 3,907,353, Cl. 293-81.000.

Dixon, William D.; and Becker, Maureen E., to Monsanto Company. Alpha-cyano-alpha-dialkylphosphonato acetanilides. 3,907,937, Cl. 260-940.000.

Dlugosz, Leonard T. Installation of concrete containing railroad ties inflated in situ. 3,907,201, Cl. 238-84.000.

Dobbins, Charles. Hypodermic load calibrator. 3,907,009, Cl. 141-27.000.

Dobson, Richard N.; Gaiser, John A.; and Gris, Conrad D., to Dominion Foundries and Steel, Limited. Safety device for banking vehicles. 3,906,869, Cl. 105-164.000.

Dock, Mortimer Russell. Connector link. 3,906,716, Cl. 59-85.000.

Dr. Ing. Kaupert KG: *See—*
Martin, Eberhard, 3,907,161.

Dr. Karl Thomae GmbH: *See—*
Cullen, Ernest; Meindl, Peter; Tuppy, Hans; and Bodo, Gerhard, 3,907,804.

Dokter, Henry J.: *See—*
Corrigan, John E.; Dokter, Henry J.; and Ethington, Ambrose, 3,907,681.

Dolan, Thomas J.: *See—*
Raffelson, Harold; Lee, Roberto; and Dolan, Thomas J., 3,907,707.

Dolhyj, Serge R.: *See—*
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Domann, Helmut: *See—*
Fleischer, Helmut; Domann, Helmut; Maisch, Wolfgang; and Schnaibel, Eberhard, 3,907,380.

Dombrowski, Thaddeus: *See—*
Black, Dewie E.; Fabry, Donald F.; and Dombrowski, Thaddeus, 3,906,785.

Dominion Foundries and Steel, Limited: *See—*
Dobson, Richard N.; Gaiser, John A.; and Gris, Conrad D., 3,906,869.

Donovan, John Leslie: *See—*
Pilgrim, Thomas Albert; Cuin, David Ernest; Wightman, Colin John; and Donovan, John Leslie, 3,906,695.

Dore, James E.: *See—*
Pryor, Michael J.; and Dore, James E., 3,907,069.

Dorff, Donald R.; and Santi, Joseph A., to Hydraulic Products Incorporated. Hydraulic power translating device. 3,907,465, Cl. 418-71.000.

Dorr-Oliver Incorporated: *See—*
Roberts, Elliott J.; and Angevine, Peter Allen, 3,907,674.

Dorrance, William T.; and Schofield, Norman W., to General Dynamics Corporation. Drifting ocean buoy. 3,906,565, Cl. 9-8.00R.

Doss, Richard C.; and Cleary, James W., to Phillips Petroleum Company. Sewage and water treatment with aldehyde modified quaternary salts of vinylpyridine copolymers. 3,907,753, Cl. 260-67.500.

Dovre Ski Binding, Inc.: *See—*
Berlied, Henry P., Jr., 3,907,319.

Dow Chemical Company, The: *See—*
Byrne, Joseph B.; and Ledbetter, Harvey D., 3,908,061.
Cleereman, Kenneth J., 3,907,952.
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Edamura, Fred Y.; McKendry, Lennon H.; and Larsen, Eric R., 3,907,867.
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Gurgiolo, Arthur E., 3,907,721.
Heinert, Dietrich H.; and Broxterman, William E., 3,907,872.
Jackson, Larry L.; Seifert, Walter F.; and Collins, Daniel E., 3,907,696.
Kroposki, Lorraine M.; and Yoshimine, Masao, 3,907,815.
Liu, Gordon Y. T.; Smith, Donald R.; and Bridges, Robert D., 3,907,760.
Marzolf, Richard T., 3,908,070.
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Stude, Duane L.; and Morris, Earl F., 3,907,035.
Tedball, Carole Anne, 3,907,877.

Dow, Irving A., Jr.; and Gersitz, Carl A., to Dow, Irving A., Jr. Apparatus to improve combustion of fuel. 3,907,210, Cl. 239-553.300.

Dowbenko, Rostyslaw, to PPG Industries, Inc. Polymer curing system. 3,907,623, Cl. 156-77.000.

Downen, Ronald L.; and Hicks, Leon E., to Caterpillar Tractor Company. Fluid motor control system with manual and self-cycling modes of operation. 3,906,835, Cl. 91-308.000.

Downey, Raymond E.: *See—*
Ten Broeck, Theodore R.; and Downey, Raymond E., 3,907,734.

Draber, Wilfried: *See—*
Dickore, Karlfried; Draber, Wilfried; and Eue, Ludwig, 3,907,543.

Drake, Gerald E.; and Mitchell, Donald J., to Minnesota Mining and Manufacturing Company. Film handling device. 3,906,966, Cl. 134-46.000.

Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., to Xerox Corporation. Fusing apparatus. 3,907,492, Cl. 432-59.000.

Dravo Corporation: *See—*
Selmeczi, Joseph G., 3,907,970.

Dray, Walter L., to Bendix Corporation, The. Instrument protecting means. 3,906,798, Cl. 73-384.000.

Dresser Industries, Inc.: *See—*
Johnston, Robert R.; and Paulssen, Walter Arnold, 3,907,120.
Lichte, Carl Laurent, 3,907,191.
Martin, Paul Warren, 3,906,771.
Shieh, Ming K., 3,908,138.

Drutchas, Gilbert H., to TRW Inc. Dynamic skid control with the torque equilibrium concept. 3,907,376, Cl. 303-21.0BB.

Drzewiecki, Edward R. Multipurpose hand tool. 3,907,257, Cl. 51-170.0PT.

Dual Fuel Systems, Inc.: *See—*
Mulliner, David K., 3,907,515.

Du Bois, Jean-Pierre; and Stern, Ralph Charles, to Sunbeam Corporation. Multiple purpose cooking appliance. 3,908,111, Cl. 219-442.000.

Ducoffe, Arnold L.: *See—*
Huang, A. Ben; and Ducoffe, Arnold L., 3,907,520.

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Dudek, Ronald P.; Kosmos, Peter; and Tesk, John A., to Howmedica, Inc. Nickel alloys. 3,907,555, Cl. 75-171.000.

Dudzik, Werner M.: *See—*
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Dufour, Raymond James, to Gas Developments Corporation. Floating seal construction. 3,907,310, Cl. 277-92.000.

Dufton, John R.: *See—*
Borbas, Robert A.; and Dufton, John R., 3,908,099.

Dumbeck, Robert Francis. Electronic temperature measuring apparatus. 3,906,796, Cl. 73-362.0AR.

Duncan, Avery A., Jr., to Singer Company, The. Portable power tools. 3,908,139, Cl. 310-50.000.

Dunkl, Franz S.: *See—*
Ross, Sidney D.; Dunkl, Franz S.; and Hutchins, Clinton E., 3,908,157.

Du Pont de Nemours, E. I., and Company: *See—*
Barnes, Ronald B., 3,907,394.
Brown, Morton; and Prosser, Robert M., 3,907,926.
Currie, Robert Marion; Measamer, Shubert Gernt; and Miller, Donald Nelson, 3,907,868.
Dennis, Richard K., 3,907,400.
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Zafiroglu, Dimitri P., 3,906,588.

Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and White, George Raymond, to Smith Kline & French Laboratories Limited. Pharmaceutical compositions and methods of inhibiting histamine activity with thiourea derivatives. 3,908,014, Cl. 424-263.000.

Durham Industries, Inc.: *See—*
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Durholz, Friedrich; Putter, Rolf; and Vogel, Axel, to Bayer Aktiengesellschaft. Process for preparing 5-nitro-naphthoquinone-(1,4). 3,907,841, Cl. 260-396.00R.

Durst, Richard R., to General Tire & Rubber Company, The. Compatible three-component polymer alloys. 3,907,929, Cl. 260-876.00B.

Durst, Richard R., to General Tire & Rubber Company, The. High impact two-component polystyrene blends. 3,907,931, Cl. 260-876.00B.

Dyer, Robert S. Heating system with exterior air inlet for combustion chamber. 3,906,925, Cl. 126-110.00R.

Dygos, John H., to G. D. Searle & Co. 5-(1,2,3,4-Tetrahydro-6-methoxy-2-naphthyl)-2-hydroxy-1-methylcyclopentaneethanols. 3,907,905, Cl. 260-613.00R.

Dyhr-Mikkelsen, Poul Christian: *See—*
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Dynamic Air Inc.: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
Chen, James Ling, 3,906,951.
Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,907,822.

E S P E GmbH: *See—*
Purrmann, Robert; Schmitt, Werner; Jochum, Peter; and Grimm-Lenz, Rainer, 3,907,106.

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Early, Jack J.; and Stawsky, Alfred, to Engelhard Minerals & Chemicals Corporation. Isostatic crush strength test system. 3,906,782, Cl. 73-94.000.

Eastman Kodak Company: *See—*
Barton, Kenneth R.; and Vachon, Raymond N., 3,907,736.
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Holmes, Jerry D.; Allen, Robert P.; and Dawes, John L., 3,907,829.
Jackson, Winston J., Jr.; and Darnell, William R., 3,907,733.
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Schellenberg, Dietmar; and Bent, Richard L., 3,907,875.
Tershansy, Ronald A.; Russin, Nicholas C.; and McFarlane, Finley E., 3,907,754.

Eaton Corporation: *See—*
Kolibar, Richard W.; and Rupnik, Robert F., 3,907,448.

Ebara Manufacturing Co., Ltd.: *See—*
Machida, Shunichi; Tsujita, Masaharu; Nakaya, Shintaro; and Ueno, Ryoji, 3,907,629.

Eberlein, Wolfgang; Heider, Joachim; Diederen, Willi; and Kobinger, Walter, to Boehringer Ingelheim GmbH. Cardiac glycosides. 3,907,776, Cl. 260-210.500.

Edamura, Fred Y.; McKendry, Lennon H.; and Larsen, Eric R., to Dow Chemical Company, The. Substituted phenoxyl-acetates and derivatives thereof. 3,907,867, Cl. 260-473.00G.

Edamura, Fred Y.; and Sbragia, Ronald J., to Dow Chemical Company, The. Method for systemically controlling plant disease employing certain pyridazines. 3,907,993, Cl. 424-250.000.

Edel, Peter: *See—*
Heilmann, Fery; and Edel, Peter, 3,906,748.

Edmond, Tibor O.: *See—*
Dahl, Herbert Douglas; and Edmond, Tibor O., 3,907,045.

Edmondson, Brian John: *See—*
Boaden, Kenneth Joseph; and Edmondson, Brian John, 3,907,554.

Edmunds, Ernest R. Liquid transfer apparatus for use in the washing of containers. 3,907,011, Cl. 141-92.000.

Edwards, Philip Neil, to Imperial Chemical Industries Limited. Fumaramido bis(pyridinium salts). 3,907,782, Cl. 260-240.00J.

Effenberger, Franz; Bantel, Karl-Heinz; and Eilingsfeld, Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of aromatic ketones. 3,907,837, Cl. 260-376.000.

Efficient Instruments Corporation: *See—*
Greenberg, Earl, 3,908,081.

Eholzer, Ulrich: *See—*
Ley, Kurt; Eholzer, Ulrich; Nast, Roland; Metzger, Karl Georg; and Fritsche, Dieter, 3,908,008.

Ehrlich, Harold P., to C. G. Manufacturing Co. Bracket for holding transducer. 3,907,239, Cl. 248-229.000.

Eichenberger, Werner; Lapp, Karl; Loepfe, Erich; and Stutz, Hansruedi, to Aktiengesellschaft Gebruder Loepfe. Optoelectrical apparatus. 3,907,440, Cl. 356-199.000.

Eichhorst, Peter C. Latch detector stop motion system for circular knitting machines. 3,906,752, Cl. 66-157.000.

Eichorn, Roger H., deceased; and Lincoln First Bank of Rochester, executor, to Xerox Corporation. Reverse path imaging and transfixing copying machine. 3,908,125, Cl. 250-316.000.

Eijnthoven, Ronald Karel: *See—*
Heijne, Leopold; Beekmans, Nicolaas Marinus; Poolman, Petrus Jacobus; and Eijnthoven, Ronald Karel, 3,907,657.

Eilingsfeld, Heinz: *See—*
Effenberger, Franz; Bantel, Karl-Heinz; and Eilingsfeld, Heinz, 3,907,837.

Eisemann, Kurt, to U.S. Philips Corporation. Switching device, in particular for a record player or changer. 3,907,304, Cl. 274-9.00A.

Eisenmann, Siegfried: *See—*
Harle, Hermann; Eisenmann, Siegfried; and Sickinger, Kurt, 3,907,470.

Eissler, Charles J. Hockey game. 3,907,295, Cl. 273-85.00R.

Ekenberg, Ulf Christer; Strom, Johan Paul; and Jonsson, Ragnar Georg, to U.S. Philips Corporation. Rotary vane machine with fluid flow paths on each vane side. 3,907,467, Cl. 418-82.000.

El Paso Products Company: *See—*
Lo, Ching-tsan; Miller, Joe Jed; and Cywinski, Norbert Francis, 3,907,919.

Electric Golf Carts, Inc.: *See—*
Thomas, Truman A., III, 3,907,056.

Elger, Gerd, to Allianz-Technik AG. Water jet for a speed boat. 3,906,886, Cl. 115-16.000.

Eli Lilly and Company: *See—*
Delong, Donald C.; Lively, David H.; and Neuss, Norbert, 3,907,988.
Hamill, Robert L., 3,907,832.
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Jones, Charles D.; and Mason, Norman R., 3,907,842.
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Elitex, avody textilniho strojirenstvi, generalni reditelstvi: *See—*
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Eller, J. Marlin; and Eller, J. David. Submersible pumping unit. 3,907,463, Cl. 417-360.000.

Elliott, Herbert James. Swirling water vessel for forming sulfur pellets. 3,907,471, Cl. 425-6.000.

Elmendorp, Jan: *See—*
De Rooij, Abraham H.; and Elmendorp, Jan, 3,907,781.

Elrick, Donald E., to United States of America, Navy. Solution cast double base propellants and method. 3,907,619, Cl. 149-2.000.

Elsbett, Ludwig. Piston with central combustion chamber for injection-type internal combustion engines. 3,906,924, Cl. 123-193.00P.

Eltra Corporation: *See—*
Seike, Helmut K., 3,908,102.

Emery, Alvin T.; Evans, Lee G.; and Currey, John E., to Hooker Chemicals and Plastics Corporation. Flexible intercell connector for electrolytic cells. 3,907,391, Cl. 339-29.00R.

Emission Abatement, Inc.: *See—*
Haines, Harry William, Jr., 3,907,524.

Emmett, John Colin: *See—*
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Energy Development Associates: *See—*
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Symons, Philip C.; and Bjorkman, Harry K., 3,908,001.

Engel, Simon L., to Caterpillar Tractor Company. Cassegrainian mirror arrangement for lasers. 3,907,408, Cl. 350-294.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Early, Jack J.; and Stawsky, Alfred, 3,906,782.

Engl, Alfred; Marth, Kurt; and Stoever, Peter, to Siemens Aktiengesellschaft. Process of manufacturing an electrical resistive element. 3,908,041, Cl. 427-101.000.

Engstrom, John W.: *See—*
Van Houten, Roland W.; and Engstrom, John W., 3,906,736.

Ennis, Robert M., Jr., to California Linear Circuits, Inc. Combined ion implantation and kinetic transport deposition process. 3,908,183, Cl. 357-65.000.

Environmental Devices Corporation: *See—*
Brainard, Edward C., II; and Layport, John L., 3,906,790.

Eppe, Rudolf; Schnall, Gunther; Schott, Walter; Bronner, Hermann; and Ettelbruck, Rudiger, to Agfa-Gevaert Aktiengesellschaft. Apparatus for reciprocating carriages in copying machines. 3,907,422, Cl. 355-8.000.

Epple, Richard, to Licentia Patent-Verwaltungs-G.m.b.H. Method of contacting a semiconductor arrangement. 3,906,621, Cl. 29-591.000.

Erickson, Alfred J. Corner shelf structure. 3,906,872, Cl. 108-92.000.

Erickson, Marlo W. V. Transmission having an infinitely variable drive ratio. 3,906,809, Cl. 74-217.00S.

Erion, Jeffrey A.; and Peel, Richard E., to Ford Motor Company. Shoulder harness positioner. 3,907,329, Cl. 280-150.05B.

Ernst Plank KG: *See—*
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Ervin, James H., to Addressograph Multigraph Corporation. Collating device. 3,907,279, Cl. 271-173.000.

Erwin Sick, Optik-Elektronik, Firma: *See—*
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ESB Incorporated: *See—*
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Esgar, Jack B.: *See—*
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Eskofot A/S Industriparken: *See—*
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Esner, Stanislav: *See—*
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Ethyl Corporation: *See—*
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Ethyl Development Corporation: *See—*
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Ethylene Plastique: *See—*
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Etienne, Szarvasi; Didier, Festal; and Marcel, Grand, to Lipha-Lyonnaise Industrielle Pharmaceutique. Derivatives of spiro-[piperidine-4':6-(3,2-a)-thiazolopyrimidine]. 3,907,800, Cl. 260-256.50R.

Ettelbruck, Rudiger: *See—*
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Eue, Ludwig: *See—*
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Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert Rudolf; and Eue, Ludwig, 3,907,540.

Evans, Edgar L. Cartridge feed magazine assembly with self-contained follower spring. 3,906,652, Cl. 42-50.000.

Evans, Lee G.: *See—*
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Evans, Robert M.; and Fogel, Joseph S., to Isonetics Corporation. Method for making seamless flooring and the like. 3,908,043, Cl. 427-203.000.

Evers, William John; Vock, Manfred Hugo; and Pelse, Igor Alexander, to International Flavors & Fragrances Inc. Stero configurations of 3((2-mercapto-1-methylpropyl)thio)-2-butanol. 3,907,900, Cl. 260-609.00R.

Evinger Corporation: *See—*
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Ewald, Jerome T.: *See—*
Lewis, Richard L.; Ewald, Jerome T.; and Shields, Martin A., 3,907,375.

Ewers, Ronald L., to Game Time, Inc. Circular bicycle rack. 3,907,114, Cl. 211-20.000.

Exxon Nuclear Company Inc.: *See—*
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Exxon Production Research Company: *See—*
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Exxon Research and Engineering Company: *See—*
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Oswald, Alexis A.; and Murrell, Lawrence L., 3,907,852.
Prentice, James S., 3,907,604.
Riley, Kenneth L.; and Maness, Dale D., 3,907,711.
Winn, Russell Edward, 3,906,572.

Eyelet Specialty Co., Inc.: *See—*
Idec, Eric J.; Klimeck, Edward F.; and Marshall, Francis G., 3,907,441.

Ezzo, Philomine A. Portable examining unit with stirrups. 3,907,270, Cl. 269-328.000.

F. P. Rosback Co.: *See—*
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F. W. Means & Company: *See—*
Corrigan, John E.; Dokter, Henry J.; and Ethington, Ambrose, 3,907,681.

Fabrique Alsacienne de Chaussures Denu & Heckel, S.A.: *See—*
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Fabrique d'Horlogerie Chs. Tissot et Fils S.A.: *See—*
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Fabry, Donald F.: *See—*
Black, Dewie E.; Fabry, Donald F.; and Dombrowski, Thaddeus, 3,906,785.

Fafco Incorporated: *See—*
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Falbe, Jurgen: *See—*
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Fanciullo, Ralph D.; and Fasolino, Ludwig G., to Polaroid Corporation. Flat battery. 3,907,599, Cl. 136-111.000.

Farkas, Lorant: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andreas; Farkas, Lorant; Antus, Sandor; and Kovacs, Maria, 3,907,830.

Fasolino, Ludwig G.: *See—*
Fanciullo, Ralph D.; and Fasolino, Ludwig G., 3,907,599.

Faust, Werner, to Vulkan Kupplungs-und Getriebebau; and Hackforth, Bernhard. Elastic coupling. 3,906,745, Cl. 64-11.00R.

FCE-Dillon, Inc.: *See—*
Dillon, Thomas J., 3,906,686.

Feder, Raymond L.; Fuhrmann, Robert; Pisanchyn, John; Elishewitz, Saul; Insinger, Thomas H.; and Mathew, Chempolil Thomas, to Allied Chemical Corporation. Continuous process for preparing cumene hydroperoxide. 3,907,901, Cl. 260-610.00B.

Federov, Alexandr Vasilievich: *See—*
Shepovalov, Vyacheslav Dmitrievich; Federov, Alexandr Vasilievich; Puzankov, Anatoly Grigorievich; Khmyrov, Viktor Alexeevich; Delokas, Eduard Petrovich; Agafonov, Igor Danilovich; Bataev, Evgeny Ivanovich; and Khabatov, Boris Shugaibovich, 3,907,112.

Feichtinger, Hans; Kluy, Werner; and Falbe, Jurgen, to Ruhrchemie Aktiengesellschaft. Process for the production of azomethine compounds. 3,907,894, Cl. 260-566.00R.

Fencl, Vernon: *See—*
Luedi, Hans; Fencl, Vernon; and Hess, Johann T., 3,907,371.

Ferguson, Ian, to Imperial Chemical Industries Limited. Organic titanium and silicon containing compounds. 3,907,848, Cl. 260-429.500.

Ferguson, Robert M.: *See—*
Amidon, Alan B.; Mammino, Joseph; and Ferguson, Robert M., 3,907,695.

Fernandes, John Henry, to Combustion Engineering, Inc. Air classifier for municipal refuse. 3,907,670, Cl. 209-137.000.

Fernandes, Joseph F.: *See—*
DeGroote, Raymond S.; and Fernandes, Joseph F., 3,907,032.

Ferranti Limited: *See—*
Jackson, Sydney; and Shepherd, Alan Arthur, 3,908,075.

Ferro Corporation: *See—*
Roberts, Gordon J., 3,907,532.

Fesco, John E., to Studley Paper Company, Inc. Vacuum cleaner filter bag. 3,907,530, Cl. 55-377.000.

Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andreas; Farkas, Lorant; Antus, Sandor; and Kovacs, Maria, to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT. Isoflavone derivatives. 3,907,830, Cl. 260-345.200.

Fiberglass Engineering Incorporated: *See—*
Bramhall, Dan E., 3,906,563.

Fiberwoven Corporation, The: *See—*
Smith, Alexander M., II, 3,906,599.
Smith, Alexander M., II, 3,908,057.

Fibre Glass-Evercoat Co., Inc.: *See—*
Linder, Joseph, 3,907,245.

Fic, Vojtech: *See—*
Bures, Jiri; and Fic, Vojtech, 3,907,613.

Fidei, Frank P.; Ying, Sui-chun; and Jones, Warren W., to Westinghouse Electric Corporation. Liquid-cooled rotor for dynamoelectric machines. 3,908,140, Cl. 310-54.000.

Fiedler, Max G. Compression ignition engine. 3,907,209, Cl. 239-533.000.

Field, Joseph H., to Benfield Corporation, The. Separation of CO_2 from gas mixtures. 3,907,969, Cl. 423-223.000.

Field, Nathan D.; and Williams, Earl P., to GAF Corporation. Insoluble porous polymeric iodine complexes useful as bactericides. 3,907,720, Cl. 260-2.50R.

Fields, Mack Robert. Primary closure. 3,907,146, Cl. 215-317.000.

Fikentscher, Rolf: *See—*
Liebold, Gert; Oppenlaender, Knut; Buettner, Egon; Fikentscher, Rolf; and Mohr, Rudolf, 3,907,701.

Filatov, Andrei Dmitrievich: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.

Filss, Peter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of purifying gases using rotatable plates having a solid reaction surface layer thereon. 3,907,967, Cl. 423-210.000.

Finlayson, Thomas J.: *See—*
Ahrendt, Donald A.; and Finlayson, Thomas J., 3,907,141.

Finn, Benedict F.: *See—*
Bruno, Thomas P.; and Finn, Benedict F., 3,906,856.

Firestone Tire & Rubber Company, The: *See—*
Crane, Grant, 3,907,583.

Firmenich S.A.: *See—*
Becker, Joseph J., 3,907,831.

First Round Research, Inc.: *See—*
Smith, Eugene C., 3,906,859.

Fischer, David J.: *See—*
Chu, Bing C.; Fischer, David J.; and Kunz, Hans J., 3,907,607.

Fischer, Joerg, to Avco Corporation. Controlled projection reader. 3,907,417, Cl. 353-46.000.

Fischer, Joseph Bernard; Ito, Roy Atsushi; Ross, Walter Lee; Schmidt, Maureen Randall; and Stoddard, Stanley Ward, to RCA Corporation. Electronic scoring system for bowling establishments. 3,907,290, Cl. 273-54.00C.

Fisher, Robert F.; and Kuhl, Kenneth A., to Lay-Mor Manufacturing Company. Extensible screed and auger assembly for a road paving machine. 3,907,451, Cl. 404-101.000.

Fishlock, Ronald Christopher: *See—*
Chapman, John H.; and Fishlock, Ronald Christopher, 3,907,061.

Fiske, Kenton W.: *See—*
Jordan, William E.; Barton, Edward B.; Fiske, Kenton W.; and Swanson, Roger M., 3,907,421.

Fitko, Chester W., to Continental Can Company, Inc. Method for coating metal surfaces with aqueous dispersions of carboxyl containing polymers. 3,908,049, Cl. 427-386.000.

Fitton, Nigel S., to Singer Company, The. Drive for yarn feed roll assembly. 3,906,876, Cl. 112-79.00A.

Fitz, Joe C., to Armco Steel Corporation. Machine for making pipe-arch for culverts by deforming pipe. 3,906,773, Cl. 72-380.000.

Fitzgerald, Donald F.: *See—*
Hebert, James O., Jr.; and Fitzgerald, Donald F., 3,907,398.

Fitzpatrick, John W.; Forgensi, Rudolph; Johnston, Robert G.; and Thomas, H. Ronald, to Xerox Corporation. P-xylene vapor phase polymerization coating of electrostatographic particles. 3,908,046, Cl. 427-216.000.

Flanagan, William H., to Nexus, Incorporated. Electrical plug and jack assembly. 3,907,395, Cl. 339-99.00R.

Fleck, Horst G.: *See—*
Hudson, Donald C.; Morris, Charles R.; Fleck, Horst G.; and Senghaas, Karl A., 3,908,126.

Fleischer, Helmut; Domann, Helmut; Maisch, Wolfgang; and Schnaibel, Eberhard, to Robert Bosch G.m.b.H. Vehicle wheel anti-lock apparatus test system. 3,907,380, Cl. 303-21.0AF.

Fleischhacker, John J., to Lake Region Manufacturing Company, Inc. Coil spring wire guide. 3,906,938, Cl. 128-2.00M.

Fleischhacker, Joseph F.; and Hruby, Thomas W., to Tescom Corporation. Pressure regulator assembly. 3,906,982, Cl. 137-116.500.

Fleissner, Heinz, to Vepa AG. Combined sieve drum and tentering apparatus. 3,906,596, Cl. 26-60.000.

Fleming, Robert W.: *See—*
Albrecht, William L.; and Fleming, Robert W., 3,907,791.

Flying Dutchman, Inc.: *See—*
Lepley, James W., 3,907,131.

FMC Corporation: *See—*
Carlson, Ronald H.; and Mesiah, Raymond N., 3,907,794.

Fogel, Joseph S.: *See—*
Evans, Robert M.; and Fogel, Joseph S., 3,908,043.

Foller, Werner, to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft Bremen. Valve. 3,906,985, Cl. 137-192.000.

Follert, Hans Gunter, to Gewerkschaft Eisenhutte Westfalia. Tunnel driving apparatus. 3,907,365, Cl. 299-31.000.

Follows, Gordon William, to Imperial Chemical Industries, Inc. Stabilized polyamides. 3,907,746, Cl. 260-45.95R.

Foote, Chauncey P., Jr.: *See—*
D'Amato, Salvatore F.; and Foote, Chauncey P., Jr., 3,907,274.

Forbes, James T.; and Gantt, James E., to Universal Oil Products Company. Apparatus for countercurrent catalytic contact of a reactant stream in a multiple-stage process. 3,907,511, Cl. 23-288.00G.

Ford, John Charles, to Girling Limited. Disc brakes. 3,907,077, Cl. 188-218.0XL.

Ford Motor Company: *See—*
Asik, Joseph R.; and Hanabusa, Mitsugu, 3,906,919.
Erion, Jeffrey A.; and Peel, Richard E., 3,907,329.
Herbert, Clarence C.; Johnson, Thomas R.; and Verduce, Anthony, 3,907,941.
Jackson, Delma J.; and Medrick, John D., 3,906,912.
Kantz, Don B., 3,906,728.
Kreger, Thomas C., 3,907,199.
Maker, David L.; Peng, Stephen C.; and Thomson, David M., 3,907,741.
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Forgensi, Rudolph: *See—*
Fitzpatrick, John W.; Forgensi, Rudolph; Johnston, Robert G.; and Thomas, H. Ronald, 3,908,046.

Forgo, Gabor; Meyer, Erwin; and Moser, Karl, to Zellweger Uster AG. Apparatus for electrostatic printing with movable electrodes. 3,908,191, Cl. 346-74.0ES.

Forney Engineering Company: *See—*
George, Robert J., 3,907,340.

Forte, William B.; and Mudd, Patrick J., to National Gypsum Company. Asbestos-free drywall joint compound utilizing attapulgite clay as asbestos substitute. 3,907,725, Cl. 260-17.00R.

Forth, Timothy Frederick, to British Petroleum International Ltd., The. Isoprene production. 3,907,917, Cl. 260-680.00R.

Foseco International Limited: *See—*
Ravault, Frank Ernest George, 3,907,579.

Foss, Robert Paul, to Du Pont de Nemours, E. I., and Company. Copolymers of pivalolactone and isoprene or butadiene. 3,907,933, Cl. 260-887.000.

Foster, Gene B., to Boeing Company, The. Numerically controlled contour forming machine. 3,906,765, Cl. 72-9.000.

Foster, John B.: *See—*
Zane, James E.; and Foster, John B., 3,907,184.

Foulis, Michael John: *See—*
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Fournier, Yves: *See—*
Delorme, Pierre Claude Marcel; and Fournier, Yves, 3,907,484.

Fox, Daniel W.; Fox, Robert E.; and Deprima, Anthony E. Tethered ball batting practice device. 3,907,287, Cl. 273-26.00E.

Fox Pool Corporation: *See—*
Witte, Donald H., 3,906,688.

Fox, Robert E.: *See—*
Fox, Daniel W.; Fox, Robert E.; and Deprima, Anthony E., 3,907,287.

Fram Corporation: *See—*
Belk, Thomas E.; Blecharczyk, Stephen S.; and Shunney, Edward L., 3,907,673.

Francel, Josef; and King, James E., to Owens-Illinois, Inc. Method of producing a sealing glass composition with a uniform viscosity. 3,907,585, Cl. 106-53.000.

Franco, Simone; Puccini, Marcello; and Vallarino, Angelo, to Minnesota Mining and Manufacturing Company. Silver halide photographic emulsions with improved physical characteristics. 3,907,573, Cl. 96-114.000.

Frank, Jan: *See—*
Levinson, Harold N.; and Frank, Jan, 3,906,644.

Frank, Johann E.; and Otten, Klaus W., to NCR Corporation. Microform positioning apparatus. 3,907,416, Cl. 353-27.000.

Franke, Walter, to Motoren Forschungs GmbH & Co. KG Franken Motoren. Internal combustion engine. 3,906,908, Cl. 123-75.0CC.

Frankel, Milton B.; Witucki, Edward F.; and Vincent, David N., to Rockwell International Corporation. 2-Fluoro-2,2-dinitroethyl substituted polyethers. 3,907,907, Cl. 260-615.0BF.

Frankenberg, Henry E., to Continental Can Company, Inc. Vacuum package with improved closure. 3,907,158, Cl. 220-352.000.

Franz, Leo J., to Mead Corporation, The. Display device. 3,907,119, Cl. 211-49.00S.

Franz, Maurice F.: *See—*
Webber, Philip S.; Franz, Maurice F.; and Moline, Kenneth R., 3,906,813.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Bingmann, Waldemar, 3,906,789.

Fredericksen, Robert E.: *See—*
Izard, David G.; and Fredericksen, Robert E., 3,907,634.

Fredrickson, Clyde, to Microdry Corporation. Method for drying pasta products with microwave heating. 3,908,029, Cl. 426-242.000.

Freeman, Robert M., to Metal Marine Pilot, Inc. Autopilot employing improved hall-effect direction sensor. 3,906,641, Cl. 33-363.00R.

Frehn, Gunter, to W. Schlafhorst & Co. Maschinenfabrik. Weft storage device for warp knitting machines. 3,906,749, Cl. 66-84.00A.

Freidenberg, Anatoly Samuilovich: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.

Freter, Kurt: *See—*
Hess, Friedrich Karl; Stewart, Patrick Bryan; Possanza, Genus; and Freter, Kurt, 3,907,767.

Fridinger, Tomas L., to Minnesota Mining and Manufacturing Company. Perfluoroalkanesulfonate ester herbicides. 3,907,853, Cl. 260-456.00R.

Fried. Krupp Huttenwerke AG: *See—*
Graf, Hans; and Lutz, Harry, 3,907,547.
Steinmetz, Eberhard; and Berve, Jurgen, 3,907,548.

Friedery, Albert L.: *See—*
Gunter, Erwin J.; Sommer, Gerd R.; and Friedery, Albert L., 3,906,677.

Friedrich, Hans-Helmut; Linhart, Helmut; and Wirth, Hermann O., to Ciba-Geigy Corporation. Polyolefines with increased stability on processing, and with improved colour. 3,907,749, Cl. 260-45.85R.

Friedrich, Maria: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Friedrich, Maria, 3,907,713.

Friesem, Albert A., to Harris-Intertype Corporation. Holographic readout system. 3,907,402, Cl. 350-3.500.

Frigitronics of Conn., Inc.: *See—*
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Fritsche, Dieter: *See—*
Ley, Kurt; Eholzer, Ulrich; Nast, Roland; Metzger, Karl Georg; and Fritsche, Dieter, 3,908,008.

Fritz, Dennis W., to Horner, Amos A., a part interest. Sheet hold down and uncurler. 3,907,284, Cl. 271-273.000.

Fritz, Manfred, to Schloemann-Siemag Aktiengesellschaft. Flying shear. 3,906,827, Cl. 83-299.000.

Froelich, Richard W.: *See—*
Beighley, Clair M.; Demuth, Orin J.; and Froelich, Richard W., 3,906,719.

Frost, Lawrence W., to Westinghouse Electric Corporation. Aromatic nitrile amide polymers. 3,907,752, Cl. 260-47.0CP.

Frus, Larry D., to Stoody Company. Process for starting an operation to continuously cast metal rod. 3,907,023, Cl. 164-82.000.

Fuchs, Francis Joseph, Jr. Rotary shear. 3,906,629, Cl. 30-240.000.

Fuel Equipment Co., Inc.: *See—*
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Fugit, Brian B.: *See—*
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Fuhrmann, Robert: *See—*
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Fuji Carbon Manufacturing Co., Ltd.: *See—*
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Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; Yamada, Minoru; Yokota, Yukio; and Inouye, Kozo, 3,907,571.
Shiba, Keisuke; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, 3,907,575.
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Fuji Seiki Machine Works, Ltd.: *See—*
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Fujikawa, Akira; and Hoshino, Takashi, to Bridgestone Tire Company Limited. Tire filled with foamed material. 3,907,018, Cl. 152-310.000.

Fujima, Yukihisa: *See—*
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Fujino, Masahiko; Wakimasu, Mitsuhiro; Nakajima, Nobuo; and Aoki, Hisashi, to Takeda Chemical Industries, Ltd. L-aspartyl-aminomalonic acid diester. 3,907,766, Cl. 260-112.500.

Fujiwara, Hiroshi: *See—*
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Fujiwara, Taizo; Sasaki, Kazuyoshi; Kimura, Takanori; Nakano, Shinya; Yamaoka, Seiro; and Yamamoto, Koichi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Floating tank assembling method. 3,906,700, Cl. 52-747.000.

Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, to Matsushita Electric Industrial Co., Ltd. Liquid crystal display system. 3,907,405, Cl. 350-160.0LC.

Fukui, Suguru: *See—*
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Fukushima, Ichiro: *See—*
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Fukushima, Masayoshi: *See—*
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Furstlich Hohenzollernsche Huttenverwaltung Laucherthal: *See—*
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Furuya, Yonezo, to Micro Labo Co., Ltd. Electromagnetic pickup cartridge with tension wire and induction magnet alined axially with armature. 3,908,096, Cl. 179-100.41Z.

G.A.R.D. Industries, Inc.: *See—*
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G. D. Searle & Co.: *See—*
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Gaarder, Gilbert W., to Gray Manufacturing Company, Inc. Lightweight service jack. 3,907,252, Cl. 254-8.00B.

Gabel, Lloyd P.; and Simpson, William R., to Sandoz Inc. Trialkoxy substituted-4-amino-quinazolines and nitrates thereof in the treatment of pain due to angina pectoris. 3,908,011, Cl. 424-250.000.

Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, to Rohm GmbH. Method for the oxycarbonylation of ethylene and propylene. 3,907,882, Cl. 260-533.00A.

GAF Corporation: *See—*
Field, Nathan D.; and Williams, Earl P., 3,907,720.

Gagnon, Richard T. Voice synthesizer. 3,908,085, Cl. 179-1.0SG.

Gaines, Clarence: *See—*
Gaines, Clarence F.; and DePew, Chester C., 3,907,325.

Gaines, Clarence F.; and DePew, Chester C., to Gaines, Clarence. Sulky having adjustable structure. 3,907,325, Cl. 280-34.00R.

Gaiser, John A.: *See—*
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Galantay, Eugene E.: *See—*
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Basco, Imre; and Galantay, Eugene E., 3,907,845.

Galante, Jorge: *See—*
Rostoker, William; and Galante, Jorge, 3,906,550.

Galicia, Frank. Rotary oil recovery device with non-integral collecting head. 3,907,684, Cl. 210-242.000.

Galis, Alex J. Kerf cutting machine. 3,907,368, Cl. 299-57.000.

Gall, Martin, to Upjohn Company, The. 2-[3-[1-(dimethylamino)cyclopropyl[-4H-1,2,4-triazol-4-yl[benzophenone. 3,907,821, Cl. 260-308.00R.

Gallay S.A.: *See—*
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Galt, Homer W.: *See—*
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Game Time, Inc.: *See—*
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Ganellin, Charon Robin: *See—*
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Ganiaris, Neophytos, to Struthers Scientific and International Corporation. Preparation of soluble coffee. 3,908,033, Cl. 426-427.000.

Gantt, James E.: *See—*
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Garber, Murray, to American Cyanamid Company. Preparation of 1-alkyl-3,5-diphenylpyrazoles and 1,2-dialkyl-3,5-diphenylpyrazolium salts. 3,907,824, Cl. 260-310.00R.

Garcea, Giampaolo, to Alfa Romeo, S.p.A. Exhaust system for internal combustion engines. 3,906,722, Cl. 60-289.000.

Garcea, Giampaolo, to Alfa Romeo, S.p.A. Internal combustion engine of the fuel injection type having means for reducing the emission of unburned products with the exhaust gases. 3,906,909, Cl. 123-97.00B.

Gardner-Denver Company: *See—*
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Gardner, Ross, Jr., to Cabot Corporation. Amine curable polyepoxide compositions. 3,907,731, Cl. 260-18.0PF.

Garkina, Irina Nikolaevna: *See—*
Bukin, Vasily Nikolaevich; and Garkina, Irina Nikolaevna, 3,907,869.

Garmaise, David Lyon: *See—*
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Garner, Derek H.; Bosworth, George H.; and Barker, Roger M., to USM Corporation. Pulling and lasting machines. 3,906,569, Cl. 12-10.100.

Garrett Corporation, The: *See—*
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Garyaev, Andrei Lvovich, deceased: *See—*
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Garyaeva, Marina Andreevna, administrator: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.

Gas Developments Corporation: *See—*
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Gaston County Dyeing Machine Company: *See—*
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Gates Rubber Company, The: *See—*
Kesinger, Donald A.; and Inscho, Leland S., Jr., 3,906,875.

Gaubert, Rene J. Film unwinding and splicing apparatus. 3,907,235, Cl. 242-57.000.

Gaudry, Paul Emile, to Consolidated Foods Corporation. Electric motor brush assembly. 3,908,142, Cl. 310-242.000.

Gauvain, Roger, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Supports for cans with rotation during translation motion at the outlet from textile machines. 3,906,589, Cl. 19-159.00R.

Gay, Eddie C.; and Martino, Fredric J., to United States of America, Energy Research and Development Administration. Cathode for a secondary electrochemical cell. 3,907,589, Cl. 136-6.00R.

Gaylord, Eber W., to Gulf Research & Development Company. Reclosable downhole bypass valve. 3,907,046, Cl. 175-235.000.

Gazhur, Vladimir Fedorovich: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.

Gearmatic Company, Ltd.: *See—*
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General Connectors Corporation: *See—*
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General Dynamics Corporation: *See—*
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General Electric Company: *See—*
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MacKenzie, Burton Thornley, Jr.; and Rothenberg, Sidney, 3,908,068.
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Sheldon, Gary S.; and Shen, Peter S., 3,908,187.

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General Foods Corporation: *See—*
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George, Robert J., to Forney Engineering Company. Flange-boiler insulation cover attachment. 3,907,340, Cl. 285-192.000.

Gerbasi, Dennis P., to Xerox Corporation. Wobble jogger. 3,907,276, Cl. 271-80.000.

Gerding, Charles Christian; and Todora, Louis John, to Jones & Laughlin Steel Corporation. Method of dispensing low velocity liquid material. 3,907,163, Cl. 222-1.000.

Gergoe, Bela; and Pelchat, Paul F., to General Motors Corporation. Push button type door handle assembly for energizing an auxiliary lighting circuit of a vehicle. 3,908,149, Cl. 315-84.000.

Gernhardt, Paul: *See—*
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Gersitz, Carl A.: *See—*
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Gianessi, Albert; and Wirt, Leon Arnold, to Caterpillar Tractor Company. Pinned on modular attachments with interchangeable components. 3,907,333, Cl. 280-415.00R.

Gidos, John P. Article holder. 3,907,243, Cl. 248-441.000.

Gilbert, Max I. Cricothyrostomy instrument. 3,906,956, Cl. 128-305.300.

Gilden, John Richard, to Nuclear Power Group Limited, The. Insulation retaining plates for pressure vessels. 3,907,151, Cl. 220-63.00R.

Gill, Stephen Harold: *See—*
Bertram, August Herman; and Gill, Stephen Harold, 3,907,055.

Gillenwater, Donald Lee, to Grain Processing Corporation. Production of alkali metal gluconates. 3,907,640, Cl. 195-36.00R.

Gillery, Frank H., to PPG Industries, Inc. Apparatus for coating glass. 3,907,660, Cl. 204-298.000.

Gillette Company, The: *See—*
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Gilmont Instruments, Inc.: *See—*
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Gilmont, Roger, to Gilmont Instruments, Inc. Multitubular constant head reflux condenser. 3,907,683, Cl. 202-177.000.

Gilmore, Thomas P., to Allis-Chalmers Corporation. Bandwidth limit circuit for step voltage regulator. 3,908,163, Cl. 323-43.50S.

Girling Limited: *See—*
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Gladwin, Floyd R. Method of forming large radius curves on plate surfaces. 3,906,834, Cl. 90-11.00C.

Glasser, Melvin. Sander with dust prevention means. 3,906,682, Cl. 51-170.00T.

Glaverbel-Mecaniver: *See—*
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Glendening, Major D., to F. P. Rosback Co. Endless belt type motion transmitting device having a variable speed output for a constant speed input. 3,906,810, Cl. 74-395.000.

Globe-Union Inc.: *See—*
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Glory Kogyo Kabushiki Kaisha: *See—*
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Gmerek, Jean-Daniel: *See—*
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Gob, Walter, to SKF Industrial Trading and Development Company B.V. Apparatus for honing rollers. 3,906,675, Cl. 51-58.000.

Godley, Fred Darroll, to Modular Wall Systems, Inc. Method of forming concrete panels using electrically heated mold. 3,907,951, Cl. 264-40.000.

Goffe, William L., to Xerox Corporation. Imaging process employing friction charging in the presence of an electrically insulating developer liquid. 3,907,559, Cl. 96-1.300.

Goldberg, Leonard. Spoked wheel. 3,907,372, Cl. 301-104.000.

Gomi, Yoshifumi, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Print hammer control mechanism. 3,906,854, Cl. 101-93.340.

Goobeck, Andrew R. Large rigid demountable cargo container with open top and fold-up floor. 3,907,147, Cl. 220-1.500.

Gooding, Elwyn R. Hand gun bullet proof protective headgear. 3,906,546, Cl. 2-3.00R.

Goodliffe, Ronald Thomas. Microfiche printer. 3,907,426, Cl. 355-53.000.

Goodrich, Joseph A., to Garrett Corporation, The. Ram fluid turbine. 3,907,221, Cl. 244-58.000.

Goodwin, Charles M. Door locking structure. 3,907,343, Cl. 292-33.000.

Goodwin, Paul G.: *See—*
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Gor, Vishnu P. J., to Continental Can Company, Inc. Metal coating compositions prepared from aqueous dispersions of carboxyl containing polyester resins. 3,908,050, Cl. 427-388.000.

Gorton, Howard B.; Read, George D.; and Ridgway, Keith E., to Ajax Hardware Corporation. Door support. 3,907,350, Cl. 292-338.000.

Gortz, Norman; and Maccarone, Michael B. Bladder type dispenser. 3,907,169, Cl. 222-95.000.

Gosset, Emile: *See—*
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Goto, Kenjiro, to Kansei Kogyo Kabushiki Kaisha. Digital clock. 3,906,715, Cl. 58-125.00C.

Goto, Michio; Ito, Shogo; and Tanaka, Atuio, to Teijin Limited. Melt spinning method of polyamide yarn. 3,907,743, Cl. 260-45.75C.

Goto, Tokuji: *See—*
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Goto, Toshiho; Yoshida, Dan; Yamamoto, Akira; and Onaka, Tatsumi, to Hitachi Shipbuilding & Engineering Co. Ltd. Abrasive cleaning machine. 3,906,673, Cl. 51-9.00M.

Gottsegen, Agnes: *See—*
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Gougeon, Robert, to International Envelope, Limited. Method and apparatus for producing envelopes having a closure flap. 3,906,844, Cl. 93-61.00B.

Gould, Paul F., to United States of America, Navy. Acoustic minesweeping generator. 3,906,884, Cl. 114-235.00B.

Gow, Edward John. Toast-holding stand. 3,906,848, Cl. 99-339.000.

Graczyk, Bronislaus S.; and Riester, William C., to Trico Products Corporation. Windshield wiper arm. 3,906,582, Cl. 15-250.040.

Graf, Felix; Ruegg, Albert; Guldenfels, Dieter; and Schurmann, Hans, to Rieter Machine Works Ltd. Winding apparatus. 3,907,217, Cl. 242-18.0PW.

Graf, Hans; and Lutz, Harry, to Fried. Krupp Huttenwerke AG. Method of preparing vacuum-treated steel for making ingots for forging. 3,907,547, Cl. 75-49.000.

Graham, Edward Knut Patrick: *See—*
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Graham, Robert Peter Samuel; and Graham, Edward Knut Patrick. Shock-absorber test method and apparatus. 3,906,779, Cl. 73-11.000.
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Grandio, Philip, Jr.: *See*—
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Grane, Henry R., to Atlantic Richfield Company. Method for the production of tertiary-butyl hydroperoxide. 3,907,902, Cl. 260-610.00B.
Grasselli, Robert K.; Suresh, Dev D.; and Friedrich, Maria, to Standard Oil Company, The. Superior catalyst prepared by impregnation of preformed matrix. 3,907,713, Cl. 252-462.000.
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., to Standard Oil Company, The. Coproduction of acrylonitrile and acrylic acid. 3,907,859, Cl. 260-465.300.
Grasshoff, Hans-Dieter: *See*—
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Graul, William E.: *See*—
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Gravely, Richard P., Jr., to Henry County Plywood Corporation, a part interest. Panel with decorative integral shaped edge and method of forming same. 3,907,624, Cl. 156-214.000.
Gray, Gary D., to Bralorne Resources Limited. Air cleaned and lubricated stabilizer. 3,907,048, Cl. 175-325.000.
Gray, Lew T.: *See*—
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Gray Manufacturing Company, Inc.: *See*—
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Green, Harry W.; and Cook, Ormand F., to Standard Products Co., The. Waste converter. 3,906,873, Cl. 110-7.00S.
Green, Raymond J.; and Koivunen, Erkki A., to General Motors Corporation. Rotary engine cooling system. 3,907,468, Cl. 418-83.000.
Greenberg, Earl, to Efficient Instruments Corporation. Apparatus for converting graph data into a form suitable for computer processing. 3,908,081, Cl. 178-6.800.
Greene, Albert Alfonso, to Preformed Line Products Co. Rotational collar alignment device. 3,908,120, Cl. 240-51.11R.
Grell, Wolfgang: *See*—
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Grenet, Jean-Jacques, to Union de Transports Aeriens. Airplane hangar. 3,906,691, Cl. 52-237.000.
Grenier, Wilfred J. Expansible plug valve. 3,907,251, Cl. 251-189.000.
Grethe, Guenter; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Processes and intermediates for quinine, quinidine and analogs thereof. 3,907,806, Cl. 260-284.000.
Grier, Nathaniel, to Merck & Co., Inc. Control of UV deterioration by incorporation of N-(benzimidazol-2-yl) arylcarboxamides into a UV sensitive substance. 3,907,700, Cl. 252-300.000.
Grietens, Joannes, to Glaverbel-Mecaniver. Process for the manufacture of a glazing unit. 3,907,192, Cl. 228-256.000.
Griffey, Donald E., to Quasar Electronics Corporation. Regulated power supply with start-up and protective circuits. 3,908,159, Cl. 321-11.000.
Griffith, John Dalton. Yarn feed means. 3,907,189, Cl. 226-176.000.
Griffiths, David K.: *See*—
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Griffiths, Edward, to Caterpillar Tractor Company. Resilient seal. 3,907,309, Cl. 277-84.000.
Griffiths, Leslie N., to Kelvinator, Inc. Apparatus for assembly of evaporator tubing to liner. 3,907,267, Cl. 269-8.000.
Grimm-Lenz, Rainer: *See*—
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Gringer, Donald, to Allway Tools Inc. Cutting implement. 3,906,625, Cl. 30-125.000.
Grip-Pak, Inc.: *See*—
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Gris, Conrad D.: *See*—
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Griss, Gerhart; Kleeman, Manfred; Grell, Wolfgang; and Ballhause, Helmut, to Boehringer Ingelheim GmbH. Pharmaceutical composition containing a 2-amino-4,5,7,8-tetrahydro-6H-thiazolo or -oxazolo 5,4-D azepine and method of use. 3,907,996, Cl. 424-270.000.
Grobben, Adrianus Hendrikus: *See*—
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Groome, Ernest J.: *See*—
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Gross, Sam. Magnetic toy having sculpturable particles. 3,906,658, Cl. 46-17.000.
Grothe, Horst: *See*—
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Grotnes Machine Works, Inc.: *See*—
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GTE Automatic Electric (Canada) Limited: *See*—
Borbas, Robert A.; and Dufton, John R., 3,908,099.
GTE Automatic Electric Laboratories Incorporated: *See*—
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Port, David J.; and Cheney, Richard F., 3,907,546.
Guedel, Arthur R. Mixing apparatus. 3,907,459, Cl. 416-65.000.
Guerra, Luis A., Dr. Blood taking device. 3,906,930, Cl. 128-2.00F.
Guglieri, Michel: *See*—
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Guilbault, Lawrence James; and Hoffstadt, Frederick Alan, to Calgon Corporation. Purification of methacrylamidopropyltrimethylammonium chloride. 3,907,891, Cl. 260-561.00N.
Guilbault, Lawrence James, to Calgon Corporation. Water-soluble, vinyl-pyrrolidone-acrylamide block copolymers. 3,907,927, Cl. 260-875.000.
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Gulich, Hans-Adolf, to Daimler-Benz Aktiengesellschaft. Connection between an injection internal combustion engine and a fuel tank. 3,907,002, Cl. 138-115.000.
Gunderson, Ralph R. Traction control device. 3,907,058, Cl. 180-74.000.
Gunning, John R., to Abitibi Paper Company Ltd. Apparatus and method for coating a web. 3,908,044, Cl. 427-209.000.
Gunter, Erwin J.; Sommer, Gerd R.; and Friedery, Albert L., to Maag Gear-Wheel & Machine Company, Ltd. Grinding of gear teeth. 3,906,677, Cl. 51-123.00G.
Gurgiolo, Arthur E., to Dow Chemical Company, The. High resiliency, flexible polyurethane foams and crosslinkers for the preparation thereof. 3,907,721, Cl. 260-2.5AM.
Gusev, Alexei Alexeevich. Device for relative orientation of parts. 3,906,607, Cl. 29-200.00P.
Gustafson, Robert I., executor: *See*—
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Guthrie, James L.; and Rendulic, Francis J., to W. R. Grace & Co. Photocurable polyene-polythiol lacquer composition. 3,908,039, Cl. 427-54.000.
Gutleber, Frank S., to United States of America, Army. Time division multiple access communications system. 3,908,088, Cl. 179-15.0BC.
Gutman, Arnold D., to Stauffer Chemical Company. Certain oximino phosphorus containing compounds, used as insecticides and acaricides. 3,908,006, Cl. 424-211.000.
Gutteridge, Norman James Albert: *See*—
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Gwyn, John E.; Baldwin, Lisle L.; and Brodhead, Howard, to Shell Oil Company. Process and apparatus for quenching unstable gas. 3,907,661, Cl. 208-48.00Q.
Gyarmati, Erno; and Nickel, Hubertus, to Kernforschungsanlage Juelich. Method of making fuel and fertile elements for nuclear-reactor cores. 3,907,948, Cl. 264-0.500.
Gyurka, Larry L. Combined outlet and safety switch unit with adapter. 3,908,103, Cl. 200-50.00B.
Haacke, Gottfried C., to American Cyanamid Company. Copper oxidation catalysts and method for preparing the same. 3,907,716, Cl. 252-471.000.
Haag, Herbert; Kreutter, Erich; and Muller, Wilfried, to ITT Industries, Inc. Multi-terminal connector strip. 3,907,392, Cl. 339-32.00M.
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Haas, Edwin J. Aerosol can attachment. 3,907,175, Cl. 222-402.130.
Habal, Mutaz B. Nasal air flow detection method for speech evaluation. 3,906,936, Cl. 128-2.00R.
Habermeier, Juergen; and Porret, Daniel, to Ciba-Geigy Corporation. Heterocyclic triglycidyl compounds. 3,907,719, Cl. 260-2.0EC.
Hacker, George Gordon, to Gaston County Dyeing Machine Company. Yarn package tube transfer method and means. 3,906,598, Cl. 28-1.00R.
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Hainaut, Daniel; and Demoute, Jean-Pierre, to Roussel-UCLAF. Certain monounsaturated esters used to control insects. 3,908,015, Cl. 424-278.000.
Haines, Charles W., to Dana Corporation. Universal joint sealing. 3,906,746, Cl. 64-17.00A.
Haines, Harry William, Jr., to Emission Abatement, Inc. Vapor recovery method for controlling air pollution. 3,907,524, Cl. 55-88.000.
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Hale, Thomas F. Valve means for vacuum holding device. 3,907,268, Cl. 269-21.000.
Hall, Jeffrey, to Holset Engineering Company Limited. Fluid coupling. 3,907,084, Cl. 192-58.00B.
Hall, John B.; and Sanders, James Milton, to International Flavors & Fragrances Inc. Novel tobacco product comprising one or more isomers of an octahydrotetramethyl acetonaphthone. 3,907,321, Cl. 131-17.00R.
Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., to International Flavors & Fragrances Inc. 2-Methyl-4-pentenoic acid ester fragrance. 3,907,718, Cl. 252-522.000.
Hall, John B.: *See*—
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Hall, Richard C. Flower planter assembly. 3,906,664, Cl. 47-34.000.
Hall, Roger D.: *See*—
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Halliburton Company: *See*—
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Halm, Hans, to Arlac-Werk Heiko Ippen. Dispensing device. 3,907,159, Cl. 221-23.000.
Halter, Edmund John, to Burgess Industries Incorporated. Water separator silencer. 3,907,528, Cl. 55-276.000.
Halwas, Larry E.; and Hisey, Robert W., to Gardner-Denver Company. Traverse head for rotary drill rig. 3,907,042, Cl. 173-160.000.
Hamada, Osamu, to Sony Corporation. Frequency and phase comparator. 3,908,174, Cl. 331-11.000.
Hamill, Robert L., to Eli Lilly and Company. Antibiotic A204I Derivatives. 3,907,832, Cl. 260-345.700.
Hamilton, C. Robert; Crossley, John E.; Hampton, Thomas W.; and Morris, Kenneth N., to United States of America, Navy. Fuze sterilization system. 3,906,861, Cl. 102-76.00R.
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Hammond, Gary W.; Ingenito, Donald R.; and Walmet, Gunnar E., to General Electric Company. Blood oxygenation system including automatic means for stabilizing the flow rate of blood therethrough. 3,907,504, Cl. 23-258.500.
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Hanser, Paul Edmund; and Snyder, William Lee, to Deere & Company. Direction control valve embodying a sleeve-like pressure equalizing valve element. 3,906,980, Cl. 137-106.000.
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Harker, Harry E., to Cummins Engine Company, Inc. Piston and cylinder construction. 3,906,923, Cl. 123-193.0CP.
Harlan, Alfred R., to Motorola, Inc. Pushbutton radio receiver including an improved manual tuning shaft coupling and decoupling assembly. 3,906,806, Cl. 74-10.330.
Harle, Hermann; Eisenmann, Siegfried; and Sickinger, Kurt, to Furstlich Hohenzollernsche Huttenverwaltung Laucherthal. Gear machine. 3,907,470, Cl. 418-170.000.
Harmon, Emerson R., to Amalga Corporation. Pressure vessel having a sealed port. 3,907,149, Cl. 220-3.000.
Harpavat, Ganesh L., to Xerox Corporation. Developer seal. 3,906,899, Cl. 118-637.000.
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Hauk, Ernest D., to Spinnerhawk Company. Apparatus and method for spinning pipe. 3,906,820, Cl. 81-57.170.
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Hausmann, George F., to United Aircraft Corporation. Aerodynamic window. 3,907,409, Cl. 350-319.000.
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Heft, Eldon Bertel, to General Electric Company. Method for calibrating an electric circuit breaker. 3,908,110, Cl. 219-121.0LM.
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Iida, Masaru: *See*—
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Inland Container Corporation: *See*—
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Inoue, Toshio, to Carl Manufacturing Company Ltd. Compact paper punch. 3,906,633, Cl. 30-358.000.
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Isamu, Itoi; and Kiyoshi, Sugou. Automatic register mark printing control device in an engraving machine. 3,907,425, Cl. 355-40.000.
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Itil, Turan M.; Herrmann, Werner Martin; Horowski, Reinhard; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gerd; and Wachtel, Helmut, to Schering Aktiengesellschaft. Treatment of mental depression. 3,908,007, Cl. 424-242.000.
Ito, Norihito, to Nihon Kikaikougyou Kabushiki Kaisha; and Kabushiki Kaisha Miwasyokai. Resilient supporting unit for structure such as bridges. 3,908,054, Cl. 428-64.000.
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Izard, David G.; and Fredericksen, Robert E., to United States Gypsum Company. Process for smoothing water-felted articles. 3,907,634, Cl. 162-204.000.
J. Bobst & Fils, S.A.: *See*—
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Jackson, Larry L.; Seifert, Walter F.; and Collins, Daniel E., to Dow Chemical Company, The. New heat transfer agents. 3,907,696, Cl. 252-73.000.
Jackson, Sydney; and Shepherd, Alan Arthur, to Ferranti Limited. Improvements related to lead frames, the manufacture thereof and the mounting of semiconductor devices thereof. 3,908,075, Cl. 174-68.500.
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Jameson, Douglas L., to Halliburton Company. Positioner methods and apparatus. 3,906,726, Cl. 60-327.000.

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Janssen, Harry Richard; and Lamb, Gerald Donald, to Continental Oil Company. Integrated delayed coking and thermal cracking refinery process. 3,907,664, Cl. 208-80.000.

Janssen, Paul Adriaan Jan; Van Bever, Willem Florent Maria; and Stokbroekx, Raymond Antoine, to Janssen Pharmaceutica N.V. Stereoisomeric forms of 4-anilido-3-methyl-piperidine-1-carboxylates. 3,907,811, Cl. 260-293.770.

Janssen, Paul Adriaan Jan; Van Bever, Willem Florent Maria; and Stokbroekx, Raymond Antoine, to Janssen Pharmaceutica N.V. Stereoisomeric forms of 4-anilino-3-methyl piperidines. 3,907,813, Cl. 260-293.790.

Janssen Pharmaceutica N.V.: *See*—
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Jarboe, Thomas R.; and Baker, William R., to United States of America, Energy Research and Development Administration. Apparatus for producing laser targets. 3,907,477, Cl. 425-308.000.

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Jaronko, John T.: *See*—
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Jaton, Jean-Philippe, to J. Bobst & Fils, S.A. Suction assisted endless belt separator. 3,907,278, Cl. 271-94.000.

Jeges, Paul: *See*—
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Jenkins, Charles W. Method for reducing energy in the exhaust gas of blowing glass. 3,907,533, Cl. 65-17.000.

Jenkins, Richard A.; and Trueblood, Jennifer J., to Ten Tru Inc. Dental floss applicator. 3,906,963, Cl. 132-92.00A.

Jenniges, Ernst, to Chemiebau Dr. A. Zieren GmbH & Co. KG. Low SO_2 emission sulfuric acid process form sulfur and oxygen. 3,907,979, Cl. 423-522.000.

Jensen, Erik J.; Brown, Ronald A. S.; and Wiggins, Ernest J., to Research Council of Alberta. Method of transporting oil and natural gas along a pipeline. 3,906,972, Cl. 137-13.000.

Jensen, Erik J.; and White, Leslie M., to Research Council of Alberta. Article passing rotary seal. 3,907,373, Cl. 302-14.000.

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Jensen, Kurt Baasch; Valbjorn, Knud Vagn; and Dyhr-Mikkelsen, Poul Christian, to Danfoss A/S. Device for adjusting a pneumatically operated operating element. 3,906,981, Cl. 137-115.000.

Jesevich, John; and Simkus, Vyto, to American Flange & Manufacturing Co., Inc. Container closure construction. 3,907,154, Cl. 220-85.00R.

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Jewell, Richard A.; and Lin, Kang, to Du Pont de Nemours, E. I., and Company. Imidazo-s-triazinediones and byrimido-s-triazinediones. 3,907,796, Cl. 260-249.500.

Jinks, David Martin, to Cleco Industries Ltd. Lift trucks. 3,907,140, Cl. 214-671.000.

Jinsenji, Sei, to Ricoh Co., Ltd. Microphone-speaker device. 3,908,095, Cl. 179-102.000.

Joa, Curt G. Pad folder. 3,907,272, Cl. 270-61.00R.

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Curran, Adrian Charles Ward; and Crossley, Roger, 3,907,899.

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Johns, William H., to United States of America, Army. Dual purpose projectile. 3,906,860, Cl. 102-56.000.

Johnson, Arthur L. Selective toilet flushing arrangement. 3,906,554, Cl. 4-67.00A.

Johnson, Bill E.; and Dannenmann, John E., Jr., to Bejed, Inc. Plug-in adjustable attenuator construction. 3,908,178, Cl. 333-81.00R.

Johnson & Johnson: *See*—
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Johnson, Kendrick A.: *See*—
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Argoudelis, Alexander D.; and Johnson, LeRoy E., 3,907,990.

Johnson, Stanley E. Remotely controlled water level control means for flush toilets. 3,906,553, Cl. 4-67.00A.

Johnson, Thomas R.: *See*—
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Johnston, Robert R.; and Paulssen, Walter Arnold, to Dresser Industries, Inc. Hydrostatic system for overhead crane trolley. 3,907,120, Cl. 212-26.000.

Joiner, Cosby D. Foldable chair. 3,907,359, Cl. 297-18.000.

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Jones, Charles D.; and Mason, Norman R., to Eli Lilly and Company. Preparation of 6α and 6β carboxymethylsteroid conjugates. 3,907,842, Cl. 260-397.100.

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Jones, Richard A., to B. F. Goodrich Company, The. Resinous initiator suspension for olefinic polymerization reactions. 3,907,730, Cl. 260-17.4SG.

Jones, Warren W.: *See*—
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Jonsson, Bo Ragnar; Toll, Gunnar Georg; and Bodelind, Bo Torsten Krister, to Aktiebolaget Platmanufaktur. Method and apparatus for making surface treated glass containers. 3,907,534, Cl. 65-30.000.

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Jonville, Pierre; Stohr, Helmut; and Beccu, Klaus D., to Battelle Memorial Institute. Method of manufacturing lead electrodes for storage cells. 3,907,594, Cl. 136-27.000.

Jordan, William E.; Barton, Edward B.; Fiske, Kenton W.; and Swanson, Roger M., to Xerox Corporation. Transfer apparatus for electrostatic reproducing machines. 3,907,421, Cl. 355-3.00R.

Jorgensen, Klavs Holger, to Novo Terapeutisk Laboratorium A/S. Process for purifying insulin. 3,907,676, Cl. 210-31.00C.

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Justinien, Marcel. Water-borne craft with rotatable float bodies. 3,906,888, Cl. 115-19.000.

K. R. Komarek, Inc.: *See*—
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Kaeser, Charles. Device for personal hygiene. 3,906,574, Cl. 15-29.000.

Kagata, Tooru, to Aisin Seiki Kabushiki Kaisha. Locking differential. 3,906,812, Cl. 74-711.000.

Kahn, Leonard R. Compatible AM stereophonic transmission system. 3,908,090, Cl. 179-15.0BT.

Kakinuma, Atsushi; Kanamaru, Tsuneo; Sugino, Hiromu; Asano, Tsuneo; and Yoneda, Masahiko, to Takeda Chemical Industries, Ltd. Pepsinostrepins, novel protease inhibitors from streptomyces. 3,907,764, Cl. 260-112.500.

Kakizaki, Kimio; and Suzumura, Takashi, to Hitachi Cable, Ltd. Method of forming heat transmissive wall surface. 3,906,604, Cl. 29-157.30A.

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Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyme dite: L'oreal. Indamines, process for producing the same and compositions containing indamines and processes for dyeing keratinous fibers using said compositions. 3,907,840, Cl. 260-396.00N.

Kamaike, Hiroshi: *See*—
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Kameda, Seizi: *See*—
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Kameya, Kazuo, to Toko, Inc. Delay line device. 3,908,177, Cl. 333-29.000.

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Kane, James T., to Rings for Drums, Inc. End closure assemblies for containers and improved closing rings therefor. 3,907,349, Cl. 292-256.670.

Kane, John J. Sluice gate. 3,907,250, Cl. 251-147.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
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Kaneko, Tadao: *See*—
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Kankkunen, Kauko Valdemar. Device for lowering persons and loads. 3,907,256, Cl. 254-160.000.

Kano, Hideo; Ogata, Masaru; and Yukinaga, Hisajiro, to Shionogi & Company,. Method of stimulating parthenocarpy in plants. 3,907,542, Cl. 71-88.000.

Kansai Paint Co., Ltd.: *See*—
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Kantz, Don B., to Ford Motor Company. Auxiliary water pump. 3,906,728, Cl. 60-524.000.

Kao Soap Co., Ltd.: *See*—
Kawanaka, Hideo; Katabe, Kenichi; Kameda, Seizi; and Takemoto, Go, 3,908,048.

Kappas, Chris S. Electric outboard motor. 3,906,887, Cl. 115-18.00E.

Kappeler, Heinrich: *See*—
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Kashiyama, Yoshitaka: *See*—
Yamagishi, Hidehisa; Mizuno, Hirokuni; Kashiyama, Yoshitaka; and Toyoda, Yasuhiro, 3,907,610.

Kask, Eugene, to Rogers Corporation. Gravity cell for liquid level monitoring. 3,906,795, Cl. 73-309.000.

Kasmarik, Joseph R.; and Hoffmann, Ambros S., to Avco Corporation. Bearing assembly systems. 3,907,386, Cl. 308-15.000.

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Katayama, Hajime: *See*—
Komori, Shigehiro; and Katayama, Hajime, 3,907,424.

Katayama, Shigenari: *See*—
Yamamoto, Hisao; Okamoto, Tadashi; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; and Katayama, Shigenari, 3,907,812.

Kato, Takashi: *See*—
Miyazaki, Tsutomu; Kato, Takashi; Suzuki, Yoshihisa; Yoshizawa, Toshio; and Ueda, Shozo, 3,906,712.

Katsumata, Ryoichi: *See*—
Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,907,637.
Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,907,641.

Kauffman, John H., to National Engineering Company. Impact scrubber. 3,907,213, Cl. 241-40.000.

Kawada, Sohji. Facial treatment device. 3,906,940, Cl. 128-40.000.

Kawakami, Hiroshi: *See*—
Aramaki, Kuninori; Kawakami, Hiroshi; and Suzuki, Masao, 3,907,685.

Kawakami, Hirotake; Yokoyama, Yoshihiro; and Fukumoto, Tooru, to Sony Corporation. Electrostatic transducer. 3,908,098, Cl. 179-111.00R.

Kawamoto, Hirohisa, to United States of America, Air Force. Heat sink for microstrip circuit. 3,908,188, Cl. 357-82.000.

Kawanaka, Hideo; Katabe, Kenichi; Kameda, Seizi; and Takemoto, Go, to Kao Soap Co., Ltd. Method of improving interfiber cohesion of filament yarns. 3,908,048, Cl. 427-377.000.

Kawanami, Katsusuke: *See*—
Tanaka, Shigeo; Hashimoto, Kazuyoshi; Takatsu, Toshiharu; Abe, Mitsuhiro; Sada, Hidetaki; and Kawanami, Katsusuke, 3,906,767.

Keblys, Kestutis A., to Ethyl Corporation. Compound and method. 3,907,847, Cl. 260-429.00R.

Kehr, Wolfgang: *See*—
Itil, Turan M.; Herrmann, Werner Martin; Horowski, Reinhard; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gerd; and Wachtel, Helmut, 3,908,007.

Keihan Rentan Kogyo Co., Ltd.: *See*—
Nire, Naomichi; and Sakai, Takeo, 3,907,648.

Keiper, Fritz: *See*—
Lehmann, Gerhard, 3,907,361.

Kelch, Heinz; and Muller, Helmut. Resettable counter. 3,907,198, Cl. 235-144.0DM.

Kelley, Robert B.: *See*—
Birk, John R.; Kelley, Robert B.; and Seres, David A., 3,907,180.

Kelvinator, Inc.: *See*—
Griffiths, Leslie N., 3,907,267.

Kemp, Jacob D., to Chevron Research Company. Isomerization process. 3,907,913, Cl. 260-666.00P.

Kenkel, Robert A.: *See*—
Tillotson, Henry B.; and Kenkel, Robert A., 3,906,921.

Kennecott Copper Corporation: *See*—
Skarbo, Roald R., 3,907,966.

Kennedy, Alice W.; Shank, Raymond S.; and Wardlow, Eddie, Jr., to Standard Oil Company, The. Color stabilization of nitrile-containing polymers with organotin compounds. 3,907,932, Cl. 260-881.000.

Kennedy, Frank, to United States Steel Corporation. Means for internally cooling briquetting machine rolls and segments. 3,907,486, Cl. 425-471.000.

Kennedy, Richard L., to Teledyne, Inc. Nickel base alloys of improved properties. 3,907,552, Cl. 75-122.000.

Kennedy, Thomas B. Folding ladder. 3,907,067, Cl. 182-164.000.

Kern, Joerg: *See*—
Nachbur, Hermann; Kern, Joerg; and Maeder, Arthur, 3,907,898.

Kernforschungsanlage Juelich: *See*—
Gyarmati, Erno; and Nickel, Hubertus, 3,907,948.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Filss, Peter, 3,907,967.

Kerstetter, Donald R.: *See*—
Buescher, William E.; and Kerstetter, Donald R., 3,906,601.

Kesinger, Donald A.; and Inscho, Leland S., Jr., to Gates Rubber Company, The. Transplant handling means. 3,906,875, Cl. 111-2.000.

Kessinger, Orville E., Jr., to Caterpillar Tractor Company. Mounting for idler sprocket. 3,907,382, Cl. 305-10.000.

Ketler, Albert E., Jr., to Ocean Energy, Inc. Sea water battery. 3,907,596, Cl. 136-100.00R.

Kew, Jeffrey: *See*—
Bendall, Dennis M.; Harris, William R.; Kew, Jeffrey; Sherborne, Michael C.; and Jones, John A., 3,907,280.

Khabatov, Boris Shugaibovich: *See*—
Shepovalov, Vyacheslav Dmitrievich; Federov, Alexandr Vasilievich; Puzankov, Anatoly Grigorievich; Khmyrov, Viktor Alexeevich; Delokas, Eduard Petrovich; Agafonov, Igor Danilovich; Bataev, Evgeny Ivanovich; and Khabatov, Boris Shugaibovich, 3,907,112.

Khmyrov, Viktor Alexeevich: *See*—
Shepovalov, Vyacheslav Dmitrievich; Federov, Alexandr Vasilievich; Puzankov, Anatoly Grigorievich; Khmyrov, Viktor Alexeevich; Delokas, Eduard Petrovich; Agafonov, Igor Danilovich; Bataev, Evgeny Ivanovich; and Khabatov, Boris Shugaibovich, 3,907,112.

Kida, Nobutoshi: *See*—
Saito, Kazo; and Kida, Nobutoshi, 3,906,970.

Kidd, Frank B.: *See*—
Thompson, Charles T.; Kidd, Frank B.; and Diamond, Lawrence W., 3,907,047.

Kidde, Gustave E. Process for defluorinating phosphoric acids and production of ammonium fluosilicate and fluosilicic acid. 3,907,973, Cl. 423-341.000.

Kiefer, Werner, to Jenaer Glaswerk Schott & Gen. Glass articles having a brown to reddish-brown color from borosilicate glass of a low thermal expansion by means of silver diffusion dye. 3,907,586, Cl. 106-54.000.

Kiefer, Werner, Dr.; Sack, Werner, Dr.; and Krause, Dieter, Dr., to Jenaer Glaswerk Schott & Gen. Making surface crystallized glass bodies and resulting product. 3,907,577, Cl. 106-39.700.

Kikuchi, Mikio: *See*—
Ishida, Nakao; and Kikuchi, Mikio, 3,907,778.

Kimura, Hiroshi; Kusakabe, Kensuke; Sato, Shigehiko; and Nakatani, Hiromi, to Takeda Chemical Industries, Ltd. Jelly-like foods. 3,908,027, Cl. 426-578.000.

Kimura, Takanori: *See*—
Fujiwara, Taizo; Sasaki, Kazuyoshi; Kimura, Takanori; Nakano, Shinya; Yamaoka, Seiro; and Yamamoto, Koichi, 3,906,700.

King, Donald E., to Ayr King Corporation. Ventilating system washer cleaning apparatus. 3,907,525, Cl. 55-122.000.

King, James E.: *See—*
Francel, Josef; and King, James E., 3,907,585.

King, John M.; and Bakker, Nicolaas, to Chevron Research Company. Extreme-pressure mixed metal borate lubricant. 3,907,691, Cl. 252-18.000.

Kirkbride, James W. Reduction and control of atmospheric pollutants emitted from gasoline powered internal combustion engines. 3,906,914, Cl. 123-122.0AA.

Kirn, William August: *See—*
Atkiss, Thomas Clifford; and Kirn, William August, 3,907,612.

Kiryu, Keizo. Collapsible hand truck. 3,907,322, Cl. 280-36.00C.

Kishikawa, Zitsuichi: *See—*
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Kita, Nobuyuki: *See—*
Yonezawa, Teruhiko; and Kita, Nobuyuki, 3,907,574.

Kitagawa, Yozo: *See—*
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Kitazato, Hajime: *See—*
Arai, Tomio; Fukui, Suguru; Morimoto, Tatsuo; Kitazato, Hajime; and Yokoyama, Tohru, 3,907,715.

Kitching, John Metcalfe, to C. L. (Basingstoke) Limited. Process for making injectable iron compositions for treating iron-deficiency anemia. 3,908,004, Cl. 424-180.000.

Kiyoshi, Sugou: *See—*
Isamu, Itoi; and Kiyoshi, Sugou, 3,907,425.

Kleeman, Manfred: *See—*
Griss, Gerhart; Kleeman, Manfred; Grell, Wolfgang; and Ballhause, Helmut, 3,907,996.

Klein, Heinrich; and Weber, Eduard, to Siemens Aktiengesellschaft. Steam generator. 3,907,029, Cl. 165-161.000.

Klett, Gene R.: *See—*
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Klett, Stanley D.: *See—*
Charland, Terrence D.; and Klett, Stanley D., 3,906,898.

Klimeck, Edward F.: *See—*
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Klippan G.m.b.H. Hamburg: *See—*
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Klundt, Irwin L.: *See—*
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Kluy, Werner: *See—*
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Knapp, Charles C., Jr.: *See—*
Knapp, Mary M.; Knapp, Kenneth M.; and Knapp, Charles C., Jr., 3,906,576.

Knapp, Karl K.; and Reedy, Delbert R., to Kardel Products Corporation. Passively cooled fluid storage apparatus. 3,906,744, Cl. 62-384.000.

Knapp, Kenneth M.: *See—*
Knapp, Mary M.; Knapp, Kenneth M.; and Knapp, Charles C., Jr., 3,906,576.

Knapp, Larry L.; and Knapp, Leonard A. Game cart. 3,907,323. Cl. 280-47.300.

Knapp, Leonard A.: *See—*
Knapp, Larry L.; and Knapp, Leonard A., 3,907,323.

Knapp, Mary M.; Knapp, Kenneth M.; and Knapp, Charles C., Jr. Resilient element for a bi-directional pig. 3,906,576, Cl. 15-104.06R.

Kneidl, Franz A.: *See—*
Clark, Robert P.; Haven, Robert Lee; and Kneidl, Franz A., 3,906,851.

Knight, Michael Horace; Mitchell, Barbara; and Ratcliffe, Maurice James, to Imperial Chemical Industries Limited. Moulding composition. 3,907,751, Cl. 260-47.0UA.

Knippel, Willis H., to Pullman Incorporated. Traction power rail module. 3,906,866, Cl. 104-139.000.

Knorr-Bremse GmbH: *See—*
Bablitzka, Adolf, 3,907,381.

Knox, Kenneth Howard, to Abbott Laboratories. Catheter adapter having filtered air vent. 3,906,958, Cl. 128-349.00R.

Knudsen, Kenneth F., to American Chain & Cable Company, Inc. Power and free conveyor system. 3,906,867, Cl. 104-172.00S.

Kobayashi, Nobuyuki; Sasano, Mitsunori; and Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor control mechanism. 3,907,945, Cl. 261-52.000.

Kobayashi, Shigeharu, to Fuji Seiki Machine Works, Ltd. Descaling device. 3,906,672, Cl. 51-8.00R.

Kobayashi, Shigeru: *See—*
Kozuka, Ko; Kobayashi, Shigeru; Watanabe, Akira; Iki, Yoshio; and Yokoe, Masaaki, 3,907,870.

Kobinger, Walter: *See—*
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Kobylinski, Thaddeus P.; and Taylor, Brian W., to Gulf Research & Development Company. Preparation of maleic anhydride using a catalyst containing a uranyl ion. 3,907,835, Cl. 260-346.800.

Kobylinski, Thaddeus P.; and Taylor, Brian W., to Gulf Research & Development Company. Process for reducing the content of nitrogen oxides in a gaseous mixture containing the same. 3,907,968, Cl. 423-213.500.

Kobylinski, Thaddeus P.: *See—*
Beuther, Harold; Kobylinski, Thaddeus P.; and Vogel, Roger F., 3,908,047.

Kocherginsky, Meer Danilovich; Kalachev, Sergei Leonidovich; Naumenko, Victor Arsenievich; and Penkova, Lidia Fedorovna. Storage cell with dissoluble negative line electrodes. 3,907,603, Cl. 136-140.000.

Koeda, Kenji: *See—*
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Koehring Company: *See—*
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Koenig, Peter: *See—*
Simons, Willi; Grothe, Horst; Haselhuhn, Rolf; Koenig, Peter; and Brock, Klaus, 3,907,022.

Kohata, Mamoru: *See—*
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Koivunen, Erkki A.: *See—*
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Kokado, Hiroshi: *See—*
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Kolb, Gunter: *See—*
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Kolb, Robert C.: *See—*
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Kolibar, Richard W.; and Rupnik, Robert F., to Eaton Corporation. Knob. 3,907,448, Cl. 403-361.000.

Kollar, John: *See—*
Harvey, Robert Joseph; Kollar, John; and Schmidt, John Philip, 3,907,874.

Komachiya, Yoshioki: *See—*
Uzuki, Teruo; Takahashi, Mayumi; Noda, Misa; Komachiya, Yoshioki; and Wakamatsu, Hachiro, 3,907,638.

Komarek, Karl R., to K. R. Komarek, Inc. Segmented briquetting roll structure. 3,907,485, Cl. 425-470.000.

Komori, Shigehiro; and Katayama, Hajime, to Canon Kabushiki Kaisha. Copying apparatus. 3,907,424, Cl. 355-29.000.

Kondo, Hirosi. Spray device. 3,907,206, Cl. 239-357.000.

Kondo, Sadao: *See—*
Tsukamoto, Youji; and Kondo, Sadao, 3,907,522.

Kondo, Yutaka; and Nishina, Shuho, to Toyota Jidosha Kogyo Kabushiki Kaisha. Safety apparatus for steering wheel assembly. 3,907,330, Cl. 280-150.0AB.

Konishi, Masami: *See—*
Tateno, Hidenori; Konishi, Masami; Arai, Hisaharu; and Koeda, Kenji, 3,907,943.

Konovalov, Anatoly Ivanovich: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.

Koontz, Harry S.: *See—*
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Kopita, Robert: *See—*
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Koppers, Manfred, to Rheinstahl AG. Device for shielding ground workings with means for controlling the dust. 3,906,733, Cl. 61-45.00D.

Korbel, Adrian Charles; and Pierrot, Victor Charles, III, to Deere & Company. Shock absorbing connection between a grapple and a winch line. 3,907,137, Cl. 214-147.00R.

Korematsu, Mikio: *See—*
Tsuji, Tadashi; and Korematsu, Mikio, 3,907,958.

Korger, Heinz: *See—*
Marker, Hannes; Korger, Heinz; and Steinmetz, Hans-Joachim, 3,907,316.

Kornis, Gabriel; and Nidy, Eldon G., to Upjohn Company, The. M-phenylurea and phenylthiourea oxime derivatives. 3,907,888, Cl. 260-553.00A.

Kors, David L.: *See—*
Addoms, John F.; Kors, David L.; and Lawver, Billy R., 3,906,725.

Kosmos, Peter: *See—*
Dudek, Ronald P.; Kosmos, Peter; and Tesk, John A., 3,907,555.

Kouchi, Toshihiro: *See—*
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Kovacs, Maria: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andreas; Farkas, Lorant; Antus, Sandor; and Kovacs, Maria, 3,907,830.

Kozuka, Ko; Kobayashi, Shigeru; Watanabe, Akira; Iki, Yoshio; and Yokoe, Masaaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Polymerizable emulsifying agent. 3,907,870, Cl. 260-485.00J.

Kraftco Corporation: *See—*
Runge, Heinz F., 3,906,609.

Kraftwerk Union Aktiengesellschaft: *See—*
Pfister, Karl, 3,908,152.

Krahmer, Gary P.: *See*—
Hobbs, Billy H.; Krahmer, Gary P.; and Wood, Virgil W., 3,907,007.

Krampe, Dietrich; and Linden, Wilhelm, to Siemens Aktiengesellschaft. Arrangement for synchronizing static thyristor converters for supplying three phase motors. 3,908,132, Cl. 307-87.000.

Kraupa, Werner, to Siemens Aktiengesellschaft. Steam generator. 3,906,904, Cl. 122-32.000.

Krause, Dieter, Dr.: *See*—
Kiefer, Werner, Dr.; Sack, Werner, Dr.; and Krause, Dieter, Dr., 3,907,577.

Krebs Engineers: *See*—
Melin, Deering D., Jr., 3,907,523.

Kreger, Thomas C., to Ford Motor Company. Combination engine cooling system and passenger compartment heating system for an automotive vehicle. 3,907,199, Cl. 237-12.30B.

Kreiner, Hans-Jurg, to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munich. Pneumatic conveyor tube system. 3,907,231, Cl. 243-2.000.

Kreitzberg, Ernest A., to Allis-Chalmers Corporation. Multiple speed transmission. 3,906,817, Cl. 74-740.000.

Kreutter, Erich: *See*—
Haag, Herbert; Kreutter, Erich; and Muller, Wilfried, 3,907,392.

Krienke, Heinz Herbert. Centrifugal pump. 3,907,456, Cl. 415-71.000.

Kristen, Edward J. Election process game board apparatus. 3,907,299, Cl. 273-134.0AD.

Kroeger, Henry H., to Worthington Pump International Inc. Hydraulic displacement type pumping system. 3,907,462, Cl. 417-102.000.

Krol, Thijs, to U.S. Philips Corporation. Time-division telecommunication system for the transmission of data via switched connections. 3,908,087, Cl. 179-15.0AF.

Kropac, Joseph M., to Xerox Corporation. Manifold imaging utilizing silica gel activating layer. 3,907,558, Cl. 96-1.00M.

Kropelnitski, Edward. Multiple bicycle support system. 3,907,113, Cl. 211-19.000.

Kroposki, Lorraine M.; and Yoshimine, Masao, to Dow Chemical Company, The. Process for preparing phosphorothioates and phenylphosphonothioates. 3,907,815, Cl. 260-294.80K.

Krummenacker, Edward: *See*—
Marino, Francis C.; and Krummenacker, Edward, 3,908,086.

Ksiensyk, Klaus; and Rocholl, Henning, to Bergische Stahl Industrie. Articulating system for a central buffer coupling. 3,906,868, Cl. 105-4.00R.

Ksienysk, Klaus; and Chatterjee, Barun Kumar, to Bergische Stahl Industrie. Push and pull device, especially for light rail vehicles and cabin vehicles. 3,907,122, Cl. 213-14.000.

Kubo, Kazuo: *See*—
Murakami, Masuo; Kubo, Kazuo; Arima, Hideki; and Sano, Kenji, 3,907,879.

Kubo, Tunesuke. Ignition plug. 3,908,145, Cl. 313-123.000.

Kubota, Takeshi; and Ueda, Mikio, to Mitsui Shipbuilding and Engineering Co., Ltd. Process of preparing desulfurized light oil and fuel gas from heavy oil. 3,907,662, Cl. 208-53.000.

Kubota, Tomio, to Kabushiki Kaisha Ricoh. Pyronyl-pyrylium sensitizers for electrophotographic organic photoconductors. 3,907,561, Cl. 96-1.600.

Kuhfus, Gerd, to Northern Electric Company Limited. Pushbutton switch assembly with interlock structure. 3,908,101, Cl. 200-5.0EA.

Kuhl, Kenneth A.: *See*—
Fisher, Robert F.; and Kuhl, Kenneth A., 3,907.451.

Kuhlmann, George E., to Standard Oil Company, The. Quality of phthalic acids improved by oxidizable organic acids. 3,907,881, Cl. 260-524.00R.

Kuhn, Lawrence; Myers, Robert A.; Pennington, Keith S.; and Shah, Bankim R., to International Business Machines Corporation. Method and device for detecting the velocity of droplets formed from a liquid stream. 3,907,429, Cl. 356-28.000.

Kuhn, Robert R.: *See*—
Machleder, Warren H.; and Kuhn, Robert R., 3,907,518.

Kullman, Russell M. H.: *See*—
Reinhardt, Robert M.; Kullman, Russell M. H.; Cashen, Norton A.; and Reid, John D., 3,907,497.

Kumabe, Hirohide; Morimoto, Akio; Kitagawa, Yozo; and Shiraishi, Nobuhide, to Japan Synthetic Rubber Co., Ltd. Polyvinyl chloride resin composition. 3,907,928, Cl. 260-876.00R.

Kummer, Pierre. Tool holder for reversible cutting element. 3,906,602, Cl. 29-96.000.

Kunkel, Fredolin Edward: *See*—
Sano, Roy Michio; and Kunkel, Fredolin Edward, 3,907,266.

Kunnen, Josef: *See*—
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Kunststoff GmbH: *See*—
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Kunz, Hans J.: *See*—
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Kuroda, Toshiro: *See*—
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Kurt H. Volk, Inc.: *See*—
Lyon, Randolph S., Jr., 3,907,271.

Kurtz, Clark N., to Eastman Kodak Company. Standard and color television reproduction from superposed monochrome images apparatus and method. 3,908,192, Cl. 358-5.000.

Kurz, Reinhard. Control unit for automatic watering of flowers. 3,906,978, Cl. 137-78.000.

Kusakabe, Kensuke: *See*—
Kimura, Hiroshi; Kusakabe, Kensuke; Sato, Shigehiko; and Nakatani, Hiromi, 3,908,027.

Kuwada, Yutaka: *See*—
Meguro, Kanji; and Kuwada, Yutaka, 3,907,820.

Kuwertz, Erich, to Pfalzstahlbau GmbH. Coupling means for circuit conveyor. 3,906,864, Cl. 104-88.000.

Kwan, Okun; and Masi, James Vincent, to Bunker Ramo Corporation, The. Matrix wire print head with free bending print wires. 3,907,092, Cl. 197-1.00R.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,907,637.
Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,907,641.

L.D.M., Inc.: *See*—
McClung, Lonnie D., 3,906,643.

LaBate, James B. Self wedging devices for side boards in ingot molds. 3,907,246, Cl. 249-202.000.

LaBate, James B. Holding device for side boards in ingot molds. 3,907,247, Cl. 249-202.000.

Labavia S.G.E.: *See*—
Lemonnier, Daniel Claude, 3,908,141.

Lacrex Brevetti S.A.: *See*—
Pasbrig, Max, 3,908,146.

Lacroix, Roger Claude, to Comptoir Lyon-Alemand-Louyot. Multilayer supported catalysts of the platinoid family. 3,907,708, Cl. 252-439.000.

Lafuze, David Logan, to General Electric Company. Starter-generator utilizing phase controlled rectifiers to drive a dynamoelectric machine as a brushless motor in the starting mode to increase the torque output of the machine through phase angle control by reducing the machine counter EMF. 3,908,130, Cl. 290-46.000.

Laine, Francois: *See*—
Antonini, Albert; Joffre, Philippe; and Laine, Francois, 3,907,912.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
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Lake Region Manufacturing Company, Inc.: *See*—
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Lakes, Ardyth Dale: *See*—
Rosendale, William Lee; and Lakes, Ardyth Dale, 3,908,063.

Lam, Hing-Yat: *See*—
De Luca, Hector F.; Schnoes, Heinrich K.; and Lam, Hing-Yat, 3,907,843.

Lamb, Gerald Donald: *See*—
Janssen, Harry Richard; and Lamb, Gerald Donald, 3,907,664.

Lamb, Kay R. Resilient material tap valve with magnetic closure assist. 3,906,989, Cl. 137-320.000.

Lambuth, Alan L.; and Hearon, William Montgomery, to Boise Cascade Corporation. Thermosetting adhesive compositions extended with cellulosic paper mill sludges. 3,907,728, Cl. 260-17.200.

Lamm, Gunther: *See*—
Dehnert, Johannes; and Lamm, Gunther, 3,907,769.

Lampe, Donald R.; White, Marvin H.; and Blaha, Franklyn C., to Westinghouse Electric Corporation. Non-volatile memory cell. 3,908,182, Cl. 357-24.000.

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Lang, William H.: *See*—
Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., 3,907,915.

Langer, Horst G.: *See*—
Polemenakos, Sotiros C.; and Langer, Horst G., 3,908,009.

LaPointe, Gabriel M., to Parker Manufacturing Company. Rivet gun. 3,906,774, Cl. 72-391.000.

Lapp, Karl: *See*—
Eichenberger, Werner; Lapp, Karl; Loepfe, Erich; and Stutz, Hansruedi, 3,907,440.

Lares, Albert J.: *See*—
Lares, Joseph P.; and Lares, Albert J., 3,906,635.

Lares, Joseph P.; and Lares, Albert J. Dental handpiece. 3,906,635, Cl. 32-27.000.

Lark Luggage Corporation: *See*—
Pelavin, Joseph Y., 3,907,118.

Larsen, Eric R.: *See*—
Edamura, Fred Y.; McKendry, Lennon H.; and Larsen, Eric R., 3,907,867.

Larson, Thomas P.: *See*—
United States of America, National Aeronautics and Space Administration; DesCamp, Victor A.; Boex, Michael W.; Hussey, Michael W.; and Larson, Thomas P., 3,907,686.

Laser Alignment, Inc.: *See*—
Roodvoets, Roger J., 3,907,435.

Lasserre, Guy: *See*—
Didelot, Pierre; Lasserre, Guy; Letourneau, Georges; and Sudan, Jean Marie, 3,908,032.

Lauck, Helmut, to Varta Aktiengesellschaft. Positive sulphur electrode for galvanic cells and method of producing the same. 3,907,591, Cl. 136-6.0LN.

Laufer, Helmut, to Robert Bosch G.m.b.H. Fuel injection apparatus for internal combustion engines. 3,906,916, Cl. 123-139.0AP.

Laursen, Oskar F., to Wood Industries, Inc. Web turning bar device. 3,906,855, Cl. 101-223.000.

Lavish, Ronald E., to Caterpillar Tractor Company. Diagonal brace bearing for crawler-type tractors. 3,907,054, Cl. 180-9.600.

Lawrence Brothers, Inc.: *See*—
Newlon, Robert L.; and Bernstein, Benjamin, 3,907,344.

Lawrence Peska Associates, Inc.: *See*—
Harvey, Earl William, 3,907,013.
Shafer, Kenneth A., 3,907,072.

Lawson, Drew B., to United States of America, Navy. Concentric cylinder heat exchanger. 3,907,028, Cl. 165-156.000.

Lawson, Thomas Gordon, to Girling Limited. Control valve for anti-skid air braking system. 3,907,379, Cl. 303-21.00F.

Lawver, Billy R.: *See*—
Addoms, John F.; Kors, David L.; and Lawver, Billy R., 3,906,725.

Lay-Mor Manufacturing Company: *See*—
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Layne, Harold W.: *See*—
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Layport, John L.: *See*—
Brainard, Edward C., II; and Layport, John L., 3,906,790.

Leach, Bruce E., to Continental Oil Company. Calcining method for alumina. 3,907,982, Cl. 423-630.000.

Leach, John Meredith. Sealed, easily cleanable gate valve. 3,906,992, Cl. 137-315.000.

Lear Motors Corporation: *See*—
Carlson, Randolph S., 3,906,731.

Leatherby, Vincent C., to Fuel Equipment Co., Inc. Apparatus and method for preheating refractory lined ladles. 3,907,260, Cl. 266-1.00R.

Leclercq, Daniel Jules, to Societe des Etablissements Andouart. Extrusion machine. 3,907,259, Cl. 259-192.000.

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Byrne, Joseph B.; and Ledbetter, Harvey D., 3,908,061.

Leddy, Robert. Water sealing component for installing siding. 3,906,699, Cl. 52-712.000.

Leder, Lewis B., to Xerox Corporation. Liquid crystalline compounds. 3,907,406, Cl. 350-160.0LC.

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Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 3,907,783.

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Lee, Merle D.; and Lee, Lloyd R., 3,907,531.

Lee, Merle D.; and Lee, Lloyd R., to Raymond Lee Organization, Inc., The, a part interest. Air filter for an oil burner. 3,907,531, Cl. 55-491.000.

Lee, Roberto: *See*—
Raffelson, Harold; Lee, Roberto; and Dolan, Thomas J., 3,907,707.

Leech, Edward J.: *See*—
Polichette, Joseph; Leech, Edward J.; and Nuzzi, Francis J., 3,907,621.

Leenhouts, Albert C., to Superior Electric Company, The. Digitally determined velocity control method and means for a digital motor system. 3,908,195, Cl. 444-1.000.

Legg, James B. Article handling apparatus. 3,907,124, Cl. 214-1.0BC.

Legille, Edouard, to S.A. Des Anciens Etablissements Paul Wurth. Shut-down discharge apparatus. 3,907,261, Cl. 266-17.000.

Lehmann, Gerhard, to Keiper, Fritz. Control means for the position of a vehicle seat. 3,907,361, Cl. 297-385.000.

Lehnert, Gunther: *See*—
Pampus, Gottfried; Lehnert, Gunther; and Witte, Josef, 3,907,757.

Lehr, Siegfried R. Medical energy converter. 3,906,960, Cl. 128-419.0PG.

Lehrer, Norman B.; and Peterson, David R., to Watkins-Johnson Company; and Signetics Corporation. Electro-optical transducer and storage tube. 3,908,148, Cl. 313-398.000.

Leiber, Heinz, to Teldix GmbH. Method and device for monitoring the action of an antilock controller. 3,907,378, Cl. 303-21.0AF.

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Lemonnier, Daniel Claude, to Labavia S.G.E. Eddy current retarder. 3,908,141, Cl. 310-93.000.

Lempicki, Alexander: *See*—
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Lento, Louis Leonard, Jr.: *See*—
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Leonard, Verna M. Music writing board. 3,906,831, Cl. 84-475.000.

Lepaw, Marvin I. Sharpening method. 3,906,683, Cl. 51-285.000.

Lepley, James W., to Flying Dutchman, Inc. Bottom unloading means for silo. 3,907,131, Cl. 214-17.0DA.

Lesher, George Y., to Sterling Drug Inc. Preparation of 4H-pyrido[1,2-a]pyrimidin-4-ones from cyclic alkylidene 2-pyridylaminomethylenemalonates. 3,907,798, Cl. 260-256.40F.

Lesher, George Y.; and Carabateas, Philip M., to Sterling Drug Inc. 1,4-Dihydro-4-oxo-7-pyridyl-3-quinolinecarboxylic acid derivatives. 3,907,808, Cl. 260-287.00R.

Leslie, Gurdon, to True Temper Corporation. Shank and socket joint and method of making same. 3,907,446, Cl. 403-268.000.

Leslie, Joel. Minnow trap and method of making same. 3,906,654, Cl. 43-65.000.

Letourneau, Georges: *See*—
Didelot, Pierre; Lasserre, Guy; Letourneau, Georges; and Sudan, Jean Marie, 3,908,032.

Lettieri, Frank A. Space age model. 3,907,285, Cl. 272-31.00A.

Levenhagen, Alvin W., to Rockwell International Corporation. Self-cleaning stackable container. 3,907,111, Cl. 206-511.000.

Lever Brothers Company: *See*—
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Levin, Myron M., to E-Z Por Corporation. Self-closing cap for containers such as cans and the like. 3,907,177, Cl. 222-500.000.

Levinson, Harold N.; and Frank, Jan. Method of presenting reading material to dysmetric dyslexic-identified children. 3,906,644, Cl. 35-35.00R.

Levy, Dale F.: *See*—
Bennett, Richard J.; Gray, Lew T.; and Levy, Dale F., 3,907,449.

Levy, Stephen David; Poeschel, Gordon Paul; and Scrider, Michael Stanley, to American Cyanamid Company. 0,0,0',0'-Tetraalkyl, 0,0'-vinylenedi-p-phenylene phosphorothioates. 3,907,936, Cl. 260-930.000.

Lewis, Charles W. Wire dispenser. 3,907,228, Cl. 242-129.000.

Lewis, Richard L.; Ewald, Jerome T.; and Shields, Martin A., to Bendix Corporation, The. Hydraulically actuated adaptive braking system using a single fluid. 3,907,375, Cl. 303-6.00R.

Ley, Kurt; Eholzer, Ulrich; Nast, Roland; Metzger, Karl Georg; and Fritsche, Dieter, to Bayer Aktiengesellschaft. Combating bacteria with 2-methyl-3-carboxylic acid amido-quinoxaline-1,4-di-N-oxides. 3,908,008, Cl. 424-248.000.

Lhonore, Pierre: *See*—
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, 3,907,975.

Libuha, John J.: *See*—
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Epple, Richard, 3,906,621.
Pohl, Franz Arthur; and Bohm, Harald, 3,907,600.

Lichte, Carl Laurent, to Dresser Industries, Inc. Method of constructing a rotary rock bit. 3,907,191, Cl. 228-182.000.

Liddle, Sidney G., to General Motors Corporation. Turbomachine with evenly cooled turbine shroud. 3,907,458, Cl. 415-115.000.

Liebold, Gert; Oppenlaender, Knut; Buettner, Egon; Fikentscher, Rolf; and Mohr, Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Demulsifying crude oil emulsions. 3,907,701, Cl. 252-344.000.

Liebscher, Johannes, to Leifheit International Gunter Leifheit Gesellschaft mit Beschrankter Haftung. Sweeper. 3,906,575, Cl. 15-42.000.

Light, Kenneth K.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Novel tricyclic alcohols, novel uses of tricyclic alcohols and processes for preparing same. 3,907,908, Cl. 260-617.00F.

Lilly and Company: *See*—
O'Doherty, George O. P., 3,907,892.

Lilly Industries, Ltd.: *See*—
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 3,907,846.

Lin, Kang: *See*—
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Lin, Keh-Kuang, to Du Pont de Nemours, E. I., and Company. Preparation of quinacridones by vapor phase dehydrogenation of dihydroquinacridones. 3,907,805, Cl. 260-279.00R.

Lincoln First Bank of Rochester, executor: *See*—
Eichorn, Roger H., deceased; and Lincoln First Bank of Rochester, executor, 3,908,125.

Lind, John Henric, to Polypur Forsaljnings AB. Metering device. 3,907,173, Cl. 222-330.000.

Lind, Peter A.: *See*—
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Linde Aktiengesellschaft: *See*—
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Linder, Joseph, to Fibre Glass-Evercoat Co., Inc. Plastic, two piece candle mold with integral fastening means. 3,907,245, Cl. 249-94.000.

Lindmayer, Joseph, to Communications Satellite Corporation (COMSAT). Solar cells with incorporate metal leyer. 3,907,595, Cl. 136-89.000.

Linhart, Helmut: *See*—
Friedrich, Hans-Helmut; Linhart, Helmut; and Wirth, Hermann O., 3,907,749.

Linsalato, Oronzo L.; and Pesout, Edward, Jr., to Textron Inc. Disposable fire extinguisher. 3,907,037, Cl. 169-57.000.

Lion Fat & Oil Co., Ltd.: *See*—
Isa, Hiroshi; Tomooka, Hajime; Murakami, Yoshihiko; Karube, Kenji; Inomiya, Takeshi; and Nagayama, Masuzo, 3,907,924.
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Lipha-Lyonnaise Industrielle Pharmaceutique: *See*—
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Lipp, Hayden Ivan, to Du Pont de Nemours, E. I., and Company. Process for dispersing carbon black in acrylate plastics. 3,907,727, Cl. 260-17.00R.

List, Ferdinand; and Wember, Kurt, to Chemische Werke Huls Aktiengesellschaft. Esterification catalysts. 3,907,709, Cl. 252-453.000.

Litenkova, Ljudmila Anatolievna: *See*—
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Little, Carl H., to Weber-Knapp Company. Lid mounting hinge and counterbalance mechanism. 3,906,587, Cl. 16-190.000.

Liu, Gordon Y. T.; Smith, Donald R.; and Bridges, Robert D., to Dow Chemical Company, The. Process for manufacture of high bulk density powders of olefin polymers. 3,907,760, Cl. 260-88.20R.

Liu, Robert Chung-Huan: *See—*
Hughes, John Lawrence; and Liu, Robert Chung-Huan, 3,908,013.

Liu, Wai-Min, to Xerox Corporation. High performance optical objective. 3,907,401, Cl. 350-2.000.

Lively, David H.: *See—*
Delong, Donald C.; Lively, David H.; and Neuss, Norbert, 3,907,988.

Livick, Lester R. Ball shooting game with ball receiving tunnel. 3,907,298, Cl. 273-101.000.

Lo, Allen K. W.; and Nims, Jerry C., to Dimensional Development Corporation. Calculator for stereoscopic photography. 3,908,112, Cl. 235-61.00B.

Lo, Ching-tsan; Miller, Joe Jed; and Cywinski, Norbert Francis, to El Paso Products Company. Dehydrogenation of hydrocarbons. 3,907,919, Cl. 260-680.00R.

Lobmann, Michele: *See—*
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Lock, Everett H.: *See—*
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Locker, John L. Geometrical puzzle pieces and inlay board. 3,907,303, Cl. 273-157.00R.

Lockheed Aircraft Corporation: *See—*
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Loepfe, Erich: *See—*
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Loev, Bernard: *See—*
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Loffelman, Frank Fred; and Brady, Thomas Eugene, to American Cyanamid Company. Bridged halotriazine compounds as bleach activators. 3,907,698, Cl. 252-99.000.

Lohbauer, Kenneth R.: *See—*
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Lohr, Raymond J.; Cook, Calvin S.; Goodwin, Paul G.; and Merl, Carl J., to Louis Marx & Co., Inc. Toy vehichle construction. 3,907,331, Cl. 280-270.000.

Longstaff-Tyrrell, John, to Lucas Electrical Company Limited. Spark ignition apparatus for internal combustion engines. 3,906,918, Cl. 123-148.00E.

Lorenz, Walter; Boshagen, Horst; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Pesticidal benzisoxazolo (thiono) phosphoric (phosphonic) acid esters. 3,908,005, Cl. 424-200.000.

Lorti, Daniel C. Ignition adjustment device. 3,906,917, Cl. 123-146.50A.

Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, to Boehringer Ingelheim GmbH. 15′,16′-Lower alkoxymethylidenedigitoxins. 3,907,775, Cl. 260-210.500.

Louis Marx & Co., Inc.: *See—*
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Lovitz, Alfred, Jr.: *See—*
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Lowenthal, Walter S., Jr., to Aberdeen Industries, Inc. Trap and cage for aquatic animals. 3,906,655, Cl. 43-100.000.

Lu, Chin H., to Xerox Corporation. Non-volatile conductive inks. 3,907,694, Cl. 252-62.100.

Lubrizol Corporation, The: *See—*
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Lucas Electrical Company Limited: *See—*
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Ludemann, William D., Jr.: *See—*
Sass, Samuel; Martin, John J.; and Ludemann, William D., Jr., 3,907,501.

Ludwig, Philip James, to Walker-Hall-Sears, Inc. Hybrid takeout clip. 3,907,393, Cl. 339-47.00R.

Luedemann, George M.: *See—*
Weinstein, Marvin J.; Luedemann, George M.; and Wagman, Gerald H., 3,907,771.

Luedi, Hans; Fencl, Vernon; and Hess, Johann T., to Grotnes Machine Works, Inc. Drop center truck rim and method of forming same. 3,907,371, Cl. 301-96.000.

Luethi, Christian, to Ciba-Geigy AG. Optical brighteners comprising alkoxy derivatives of distyryldiphenyl. 3,907,904, Cl. 260-613.00R.

Lumb, Henry Oliver, Jr.; and Morrissey, Robert Richard. Portable traction splint. 3,906,942, Cl. 128-84.00C.

Lunden, Clarence D.: *See—*
Buehler, Walter E.; and Lunden, Clarence D., 3,908,189.

Lundsager, Christian Bent, to W. R. Grace & Co. Hollow ceramic pellets for catalyst support. 3,907,710, Cl. 252-455.00R.

Lunn, Peter Louis; Peters, Alan Roy; and Webster, George Samuel, to Lunweb (Products) Limited. Fixing devices for being driven into and anchored in material. 3,906,832, Cl. 85-26.000.

Lunweb (Products) Limited: *See—*
Lunn, Peter Louis; Peters, Alan Roy; and Webster, George Samuel, 3,906,832.

Luscombe, Gene A. Stack forming device. 3,907,139, Cl. 214-518.000.

Lutsey, Thomas H. Machine for making snow cones. 3,907,472, Cl. 425-127.000.

Lutz, Harry: *See—*
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Luyben, Gijsbertus Cornelius; and De Wilde, Abraham Marinus, to Mars, Incorporated. Coin separator and stacker. 3,906,965, Cl. 133-1.00A.

Luzzi, John J.: *See—*
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Lynch, Thomas J.: *See—*
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Lynn, James B.; Homberg, Otto A.; and Singleton, Alan H., to Bethlehem Steel Corporation. Formic acid synthesis by lower alkyl formate hydrolysis. 3,907,884, Cl. 260-542.000.

Lynnworth, Lawrence C., to Panametrics, Inc. Area averaging ultrasonic flowmeters. 3,906,791, Cl. 73-194.00A.

Lyon, Randolph S., Jr., to Kurt H. Volk, Inc. Step-down booklet. 3,907,271, Cl. 270-37.000.

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Macaluso, Anthony, Sr.; and Rigdon, Orville W., to Texaco Inc. Synthesis of linear primary alcohols from internal olefins. 3,907,909, Cl. 260-632.0HF.

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Machida, Shunichi; Tsujita, Masaharu; Nakaya, Shintaro; and Ueno, Ryōji, to Ebara Manufacturing Co., Ltd. Multiple effect evaporator apparatus. 3,907,629, Cl. 159-13.00A.

Machleder, Warren H.; and Kuhn, Robert R., to Rohm & Haas Company. Detergent motor fuel. 3,907,518, Cl. 44-66.000.

MacKenzie, Burton Thornley, Jr.; and Prober, Maurice, to General Electric Company. Flame resistant polyolefin, method of producing same, and insulated product. 3,908,067, Cl. 428-379.000.

MacKenzie, Burton Thornley, Jr.; and Rothenberg, Sidney, to General Electric Company. Fire retarding system for polymeric compositions, and a method and products comprising the same. 3,908,068, Cl. 428-389.000.

MacKissic, Albert E.; and Kolb, Robert C., to Amerind-MacKissic, Inc. Disintegration apparatus. 3,907,216, Cl. 241-152.00A.

Macovski, Albert. Color television encoding and decoding system. 3,908,193, Cl. 358-47.000.

Maeda, Haruo, to Matsushita Electric Industrial Co., Ltd. Fibre-optics faceplate observable with high-intensity ambient illumination. 3,907,403, Cl. 350-96.00B.

Maeder, Arthur: *See—*
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Magnavox Company, The: *See—*
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Magnussen, Rolf I. Keyboard key lock mechanism. 3,906,814, Cl. 74-483.0PB.

Mahoney, Robert Emmett, to Air Preheater Company, Inc., The. Erection procedure for vertical shaft air preheaters. 3,906,606, Cl. 29-157.30R.

Maisch, Wolfgang: *See—*
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Majkrzak, Charles Peter, to International Telephone and Telegraph Corporation. Stabilizer fin control system for a towed buoy. 3,906,883, Cl. 114-235.00B.

Maker, David L.; Peng, Stephen C.; and Thomson, David M., to Ford Motor Company. Nonaqueous dispersions of thermosetting film forming polymers. 3,907,741, Cl. 260-33.6UA.

Makihara, Minoru: *See—*
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Makover, Shraga; and Pruess, David Louis, to Hoffmann-La Roche Inc. Method for producing 2-keto-L-gulonic acid. 3,907,639, Cl. 195-36.00R.

Malafosse, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Apparatus for the preparation of alkaline hyperoxide. 3,907,506, Cl. 23-260.000.

Malcosky, Norman D.; McLean, Ronald H.; Singh, Kanwal N.; and Auh, Chung M., to Columbia Gas System Service Corporation. Compact heating and cooling system. 3,907,025, Cl. 165-63.000.

Maldonado, Salomon, to Tex-Steel Corporation. Adjustable door frame. 3,906,671, Cl. 49-505.000.

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Mangus, James D., to Westinghouse Electric Corporation. Double tube heat exchanger. 3,907,026, Cl. 165-70.000.

Manino, Anthony P. Mechanism for feeding and driving screws. 3,907,014, Cl. 144-32.000.

Mann, Michael Martin, to Northrop Corporation. Optical bandpass filter. 3,907,430, Cl. 356-100.000.

Manning, Robert E., to Brunswick Corporation. Spinners knife. 3,906,627, Cl. 30-162.000.

Manoogian, Alex; and Pullen, Eric V., to Masco Corporation of Indiana. Liquid valve. 3,906,999, Cl. 137-625.320.

Manor, Gedalyahu, to Technion Research and Development Foundation, Ltd. Grader-leveler adapted for trailing by tractors. 3,907,041, Cl. 172-780.000.

Manske, Warren C.; Bretl, Robert; and Strutz, Carlon, to Bay Electric Company, Inc. Motion picture film cleaning apparatus. 3,906,579, Cl. 15-100.000.

Mansmann, Manfred; and Winter, Gerhard, to Bayer Aktiengesellschaft. Production of fibers containing silicon-oxygen bonds. 3,907,954, Cl. 264-63.000.

Mantelet, Jean, to Moulinex, Societe Anonyme. Manually operated food chopper. 3,907,215, Cl. 241-88.400.

Marcel, Grand: *See—*
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Marder, Arnold R.: *See—*
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Margraff, Rodolphe; and Bourat, Guy, to Rhone-Poulenc S.A. Sulfonated polymers derived from L-lysine. 3,907,755, Cl. 260-78.00A.

Marincic, Nikola, to GTE Laboratories Incorporated. Electrochemical cells. 3,907,593, Cl. 136-7.000.

Marinelli, Lydia J.: *See—*
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Marino, Francis C.; and Krummenacker, Edward, to Redactron Corporation. Method for establishing a data communication connection between two full duplex modems. 3,908,086, Cl. 179-2.0DP.

Marino, Frank; and Hadnagy, Thomas D. Paint roller. 3,906,581, Cl. 15-230.110.

Marion, Charles P., to Texaco Development Corporation. Process for producing reducing gas. 3,907,703, Cl. 252-373.000.

Marker, Hannes; Korger, Heinz; and Steinmetz, Hans-Joachim, to Marker, Hannes. Method and devices for releasing a ski boot from the ski. 3,907,316, Cl. 280-11.35M.

Markhart, Albert H.; and Santer, James O., to Monsanto Company. Aqueous solution of electroconductive resins and process of preparation. 3,907,738, Cl. 260-29.60R.

Marley, Robert R.; and Seelbach, Walter C., to Motorola, Inc. Voltage and temperature compensating source. 3,908,162, Cl. 323-19.000.

Marlow, Ray E.: *See—*
United States of America, National Aeronautics and Space Administration; and Marlow, Ray E., 3,907,312.

Mars, Incorporated: *See—*
Luyben, Gijsbertus Cornelius; and De Wilde, Abraham Marinus, 3,906,965.
Willis, Frederick Gordon, 3,907,086.

Marsh, John Kendall: *See—*
Betts, Cleo Elmer; and Marsh, John Kendall, 3,907,503.

Marshall, Charles W.; Henderson, Loran A.; and Zimmer, William F., Jr., to Norton Company. Abrasive articles and their method of manufacture. 3,906,684, Cl. 51-295.000.

Marshall, Francis G.: *See—*
Idec, Eric J.; Klimeck, Edward F.; and Marshall, Francis G., 3,907,441.

Marth, Kurt: *See—*
Engl, Alfred; Marth, Kurt; and Stoever, Peter, 3,908,041.

Martin, Bernard P.: *See—*
Beach, Sidney C.; and Martin, Bernard P., 3,907,876.

Martin, Eberhard, to Dr. Ing. Kaupert KG. Apparatus for denesting stacked packaging trays. 3,907,161, Cl. 221-211.000.

Martin, Irving Edwin, to RCA Corporation. High frequency semiconductor device having improved metallized patterns. 3,908,185, Cl. 357-74.000.

Martin, John J.: *See—*
Sass, Samuel; Martin, John J.; and Ludemann, William D., Jr., 3,907,501.

Martin Marietta Corporation: *See—*
Pownall, Leslie A., 3,908,082.

Martin, Paul Warren, to Dresser Industries, Inc. Expander for random trim tubing. 3,906,771, Cl. 72-122.000.

Martini, Leo J., to Master Fence Fittings, Inc. Dog kennel gate latch. 3,907,345, Cl. 292-68.000.

Martino, Fredric J.: *See—*
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Maruyama, Isamu: *See—*
Yamamoto, Hisao; Okamoto, Tadashi; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; and Katayama, Shigenari, 3,907,812.

Maruyama, Tsutomu; and Murata, Koichiro, to Kansai Paint Co., Ltd. Paint compositions for indicating irradiation dose. 3,907,732, Cl. 260-22.0XA.

Maruzen Oil Company Limited: *See—*
Sato, Mikio; Fujiwara, Hiroshi; and Takahashi, Asao, 3,907,828.

Marvel, Carl S.; Ting-Man Wong, Daniel; Westerman, Ira John; Samyn, Celeste; and Sivaramakrishnan, Parameswar, to University Patents, Inc. Paracyclophane polymers and the production thereof. 3,907,748, Cl. 260-49.000.

Marvin Glass and Associates: *See—*
Breslow, Jeffrey D., 3,907,294.

Marx, Gerhard, to Hoechst Aktiengesellschaft. Apparatus for vaporizing a developer medium in developing devices for light-sensitive materials. 3,907,027, Cl. 165-155.000.

Marx, Matthias; and Storck, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Metal coating composition of water insoluble binder and water soluble thickener. 3,907,737, Cl. 260-29.6NR.

Marx, Matthias; Dimroth, Peter; Batzill, Wolfgang; and Miksovsky, Felix, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of polymeric products. 3,907,756, Cl. 260-78.40E.

Marzolf, Richard T., to Dow Chemical Company, The. Multilayer thermoplastic barrier structure. 3,908,070, Cl. 428-474.000.

Maschinenfabrik Andritz Aktiengesellschaft: *See—*
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Maschinenfabrik Augsburg-Nurnberg A.G.: *See—*
Heissler, Herbert; Raab, Norbert; and Wurtinger, Horst, 3,908,042.

Maschinenfabrik Schweiter AG: *See—*
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Masco Corporation of Indiana: *See—*
Manoogian, Alex; and Pullen, Eric V., 3,906,999.

Masi, James Vincent: *See—*
Kwan, Okun; and Masi, James Vincent, 3,907,092.

Maslowski, Edward A., to United States of America, General Counsel. Method of making an insulation foil. 3,906,769, Cl. 72-46.000.

Mason, Norman R.: *See—*
Jones, Charles D.; and Mason, Norman R., 3,907,842.

Mason, William L.: *See—*
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Masson Scott Thrissell Engineering Limited: *See—*
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Master Fence Fittings, Inc.: *See—*
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Mastin, John B., to Hendrickson Manufacturing Company. Vehicle suspension system. 3,907,324, Cl. 280-104.50A.

Mathew, Chempolil Thomas: *See—*
Feder, Raymond L.; Fuhrmann, Robert; Pisanchyn, John; Elisbewitz, Saul; Insinger, Thomas H.; and Mathew, Chempolil Thomas, 3,907,901.

Mathias, Robert George, to Hammond Corporation. Monophonic electronic musical instrument. 3,906,830, Cl. 84-1.010.

Matono, Hirokuni: *See—*
Ushio, Masatoshi; and Matono, Hirokuni, 3,906,964.

Matsui, Yasushi: *See—*
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Matsumoto, Hirofumi: *See—*
Nakada, Masahiko; and Matsumoto, Hirofumi, 3,906,911.

Matsuno, Kazuo: *See—*
Naruse, Katutoshi; Hasegawa, Kazuhiko; Matsuno, Kazuo; Yomogida, Toshikiko; and Sanpe, Hideyuki, 3,908,117.

Matsushita Electric Industrial Co., Ltd.: *See—*
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, 3,907,405.
Hiraki, Hisao; Hasegawa, Seiro; and Shirakusa, Hiroshi, 3,908,083.
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Matsushita, Sachio: *See—*
Shirasu, Kazuo; Matsushita, Sachio; Hatano, Tadao; and Iwano, Haruhiko, 3,907,568.

Matthews, Charles C., to General Motors Corporation. Turbine engine oil sump emission control. 3,906,717, Cl. 60-39.080.

Mattsson, Bo Gunnar, to Aktiebolaget Electrolux. Floor treating apparatus. 3,906,585, Cl. 15-349.000.

Matumoto, Noboru; Nonoyama, Takao; Tomita, Tutomu; and Suzuki, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifying system. 3,906,723, Cl. 60-290.000.

Mauleon, Jean-Louis: *See—*
Scherrer, Claude-Jacques; Mauleon, Jean-Louis; and Gmerek, Jean-Daniel, 3,907,578.

Maurer, William C.; Heilhecker, Joe K.; and Lock, Everett H., to Exxon Production Research Company. Packing assembly. 3,907,307, Cl. 277-69.000.

Maxfield, Steven K. Thermoplastic material conveyance and handling process. 3,907,162, Cl. 222-1.000.

Maxham, Kenneth Y.; and Houghton, Richard A., to Boeing Company, The. Computer controlled optical sort system. 3,908,113, Cl. 235-61.70R.

May, Walter R.: *See—*
Bsharah, Lewis; and May, Walter R., 3,907,745.

Mayer, Friedrich, to Allgemeine Industrie Commerz, Walter Von Weizenbeck. Antilocking system. 3,907,377, Cl. 303-21.00F.

Mayerhoefer, Horst; Mueller, Wolfgang; and Sollberger, Urs. Boric acid ester of 2,2,2-tris-(bromomethyl)-ethanol. 3,907,857, Cl. 260-462.00R.

Mayfield, Harold. Anchor mount assembly. 3,906,882, Cl. 114-210.000.

Mayfield, Reid K.: *See—*
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Mayo, Alfred M.: *See—*
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Maytag Company, The: *See—*
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MCA Disco-Vision, Inc.: *See—*
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Broadbent, Kent D., 3,908,080.

McCloskey, Albert R., to Rockwell International Corporation. Antifriction ball bearing assembly. 3,907,384, Cl. 308-6.00C.

McClung, Lonnie D., to L.D.M., Inc. VOR instruction device. 3,906,643, Cl. 35-10.200.

McComas, Tommy Darrel, to Hercules Incorporated. Variable thrust rocket motor nozzle assembly, and rocket assembly containing same. 3,907,222, Cl. 244-74.000.

McConnell, Denis B. Dielectrophoretic separation of gaseous isotopes. 3,907,521, Cl. 55-11.000.

McCornack, John C.: *See—*
Connor, Donald H.; and McCornack, John C., 3,906,729.

McDonnell Douglas Corporation: *See—*
Coggins, Dolphus Larry, 3,907,609.

McDougal, John A. Magnetic heading reference. 3,907,431, Cl. 356-114.000.

McElroy, Robert, to Cable Climber Safety Devices, Incorporated. Cable lock shoe. 3,907,255, Cl. 254-156.000.

McEwin, Bennie L. Safety reflector for bicycle. 3,907,404, Cl. 350-99.000.

McFarlane, Finley E.: *See—*
Tershansy, Ronald A.; Russin, Nicholas C.; and McFarlane, Finley E., 3,907,754.

McGannon, William J.: *See—*
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McGean Chemical Co., Inc.: *See—*
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McGraw, William E.: *See—*
Burton, Albert C.; McGraw, William E.; and Savino, Thomas V., 3,907,060.

McIntyre, Newman, to McIntyre Packaging Company. Apparatus and method for packaging shoelaces. 3,906,701, Cl. 53-3.000.

McIntyre Packaging Company: *See—*
McIntyre, Newman, 3,906,701.

McKendry, Lennon H.: *See—*
Edamura, Fred Y.; McKendry, Lennon H.; and Larsen, Eric R., 3,907,867.

McKenzie, Theodore R., to George R. Hall, Inc. Paper catcher device. 3,907,281, Cl. 271-219.000.

McLain, Charles D., to Olin Corporation. Process for preparing heat exchanger tube. 3,906,605, Cl. 29-157.30R.

McLean, Ronald H.: *See—*
Malcosky, Norman D.; McLean, Ronald H.; Singh, Kanwal N.; and Auh, Chung M., 3,907,025.

McLean, Ronald L., to Acme Highway Products Corporation. Composite expansion joint assembly. 3,907,443, Cl. 404-56.000.

McMahon, John E., to UDAK Corporation. Radio transmission system. 3,908,168, Cl. 325-1.000.

McMaster, Harold A.; and Nitschke, Norman C. Glass tempering system and apparatus. 3,907,132, Cl. 214-18.00R.

McNeil Corporation: *See—*
Pamer, Karl A., 3,906,865.
Wegmann, Jerome B., 3,906,845.

McPeters, Arnold L.: *See—*
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McPhillips, Norris J.: *See—*
Burge, Donald G.; and McPhillips, Norris J., 3,907,335.

Mead Corporation, The: *See—*
Franz, Leo J., 3,907,119.

Mead Johnson and Company: *See—*
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Means, Donald C., to Westinghouse Air Brake Company. Brake beam and sectionalized brake head therefor. 3,907,078, Cl. 188-222.100.

Measamer, Shubert Gernt: *See—*
Currie, Robert Marion; Measamer, Shubert Gernt; and Miller, Donald Nelson, 3,907,868.

Medley, Raymond W.: *See—*
Remley, Charles G.; Thebeau, Harold E.; and Medley, Raymond W., 3,907,039.

Medlin, Rosa M. Brick planter • building units. 3,906,665, Cl. 47-34.120.

Medrick, John D.: *See—*
Jackson, Delma J.; and Medrick, John D., 3,906,912.

Mee, Alec, to Imperial Chemical Industries Limited. Acyclic nitriles. 3,907,860, Cl. 260-465.300.

Megahed, El Sayed, to ESB Incorporated. Sealed low drain rate dry cell having in situ stable divalent silver oxide depolarizer. 3,907,598, Cl. 136-107.000.

Megna, Salvatori; Gesu, to "Jaguar" Stahlwaren Vertriebsgesellschaft mbH & Co. Scissors, particularly hairdressers' scissors. 3,906,630, Cl. 30-260.000.

Meguro, Kanji; and Kuwada, Yutaka, to Takeda Chemical Industries, Ltd. Benzodiazepine derivatives. 3,907,820, Cl. 260-308.00R.

Meier, Johann Hans; and Raider, Jerry Wesley, to International Business Machines Corporation. Type disc-interposer assembly for a printer. 3,907,091, Cl. 197-53.000.

Meindl, Peter: *See—*
Cullen, Ernest; Meindl, Peter; Tuppy, Hans; and Bodo, Gerhard, 3,907,804.

Meininger, Fritz; Hunger, Klaus; Osterloh, Fritz; and Berner, Klaus, to Hoechst Aktiengesellschaft. Process for the dyeing or printing of nitrogen containing textile materials. 3,907,495, Cl. 8-39.000.

Melin, Deering D., Jr., to Krebs Engineers. Method for removing SO_2 from gases. 3,907,523, Cl. 55-73.000.

Meller, Oscar W.; and Lovich, John W., to Goodyear Aerospace Corporation. Cargo container. 3,907,148, Cl. 220-1.500.

Mellors, Geoffrey W., to Union Carbide Corporation. Nonaqueous cell having an electrolyte containing sulfolane or an alkyl-substituted derivative thereof. 3,907,597, Cl. 136-100.00R.

Melnikov, Fedor Timofeevich: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.

Melone, Robert Richard, to Illinois Tool Works Inc. Battery cap with flame barrier vent filter. 3,907,605, Cl. 136-177.000.

Melvin Corporation: *See—*
Hull, James S., 3,906,727.

Meneghini, Pietro: *See—*
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Menn, Julius J.: *See—*
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Merck & Co., Inc.: *See—*
Christy, Marcia E., 3,907,999.
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Mercor Corporation: *See—*
Heehler, Arthur C., deceased; Gustafson, Robert I., executor; and O'Neill, Terry, 3,908,179.

Merl, Carl J.: *See—*
Lohr, Raymond J.; Cook, Calvin S.; Goodwin, Paul G.; and Merl, Carl J., 3,907,331.

Merle, Jean Pierre; and Pavie, Claude, to Schlumberger Instruments et Systemes. Tape drive system. 3,907,230, Cl. 242-192.000.

Merser, Francis G., to Dennison Manufacturing Company. Method of attaching to at least one object one of a plurality of attachments. 3,906,611, Cl. 29-417.000.

Mertzweiller, Joseph K.; and Tenney, Horace M., to Exxon Research and Engineering Company. Catalyst for hydrogenation of organic compounds. 3,907,705, Cl. 252-430.000.

Mesiah, Raymond N.: *See—*
Carlson, Ronald H.; and Mesiah, Raymond N., 3,907,794.

Messenger, Lawrence Waters, to General Electric Company. Field excitation system for synchronous machines utilizing a rotating transformer brushless exciter generating combination. 3,908,161, Cl. 322-29.000.

Metal Marine Pilot, Inc.: *See—*
Freeman, Robert M., 3,906,641.

Metal-Tech, Inc.: *See—*
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Metallgesellschaft Aktiengesellschaft: *See—*
Bohm, Eberhard; Reh, Lothar; Weckesser, Ernst; Wilde, Gunter; and Winkhaus, Gunter, 3,907,971.

Metzger, Grant W., to Carbonoyl Company. Water-free liquid fuel slurry and method of producing same. 3,907,134, Cl. 44-51.000.

Metzger, Karl Georg: *See—*
Ley, Kurt; Eholzer, Ulrich; Nast, Roland; Metzger, Karl Georg; and Fritsche, Dieter, 3,908,008.

Meunier, Georges, to Saint-Gobain Industries. Method of agglomerating glass batch materials in a fluidized bed. 3,907,956, Cl. 264-117.000.

Meyer, Carl R. Fiberglass cantilever stand for diving boards. 3,907,242, Cl. 248-346.000.

Meyer, Erwin: *See—*
Forgo, Gabor; Meyer, Erwin; and Moser, Karl, 3,908,191.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Benzoquinolizine derivatives and process for their preparation and use. 3,907,807, Cl. 260-287.00R.

Meyer, Jeffrey G., to Anderson Development Company. Chromium tris-diorgano-orthophosphates and their preparation. 3,907,849, Cl. 260-438.50R.

Mezrich, Reuben Saul: *See—*
Vilkomerson, David Herman Raphael; and Mezrich, Reuben Saul, 3,907,407.

Micheli, Adolph L.; and Sutherland, Glenn E., to General Motors Corporation. Thermoelectric exhaust gas sensor. 3,906,721, Cl. 60-276.000.

Michetti, Anthony B., to I-T-E Imperial Corporation. Multi-phase circuit breaker having spring mounting for interlocking tie bar. 3,908,104, Cl. 200-50.00C.

Michigan Chemical Corporation: *See—*
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Micka, Ernest Z., to California Institute of Technology. Cross correlation anomaly detection system. 3,908,118, Cl. 235-181.000.

Micro Labo Co., Ltd.: *See—*
Furuya, Yonezo, 3,908,096.

Microdry Corporation: *See—*
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Middendorf, Roy M., to BMR Enterprises. Workpiece indexing apparatus for machine tools. 3,906,826, Cl. 83-267.000.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. Tetrafluorodithiosuccinyl difluoride and method of preparing same. 3,907,885, Cl. 260-543.00F.

Mieville, Andre. Phenoxy-alkyl-carboxylic acid derivatives and the preparation thereof. 3,907,792, Cl. 260-247.20B.

Miksovsky, Felix: *See—*
Marx, Matthias; Dimroth, Peter; Batzill, Wolfgang; and Miksovsky, Felix, 3,907,756.

Mikulecky, Karel; Esner, Stanislav; and Tyl, Miloslav, to Vyzkumny Ustav Bavlnarsky. Open-end spinning machines provided with timing devices. 3,908,134, Cl. 307-154.000.

Milberger, Ernest C.; Dolhyj, Serge R.; and Hardman, Harley F., to Standard Oil Company, The. Process for producing maleic anhydride. 3,907,834, Cl. 260-346.800.

Miles Laboratories, Inc.: *See—*
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Betts, Cleo Elmer; and Marsh, John Kendall, 3,907,503.

Miller, Arthur F.: *See—*
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Miller, Donald Nelson: *See—*
Currie, Robert Marion; Measamer, Shubert Gernt; and Miller, Donald Nelson, 3,907,868.

Miller, Edward B.: *See—*
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Miller, Harry, to Sperry Rand Corporation. Variable throat venturi airspeed sensor. 3,906,792, Cl. 73-213.000.

Miller, Joe Jed: *See—*
Lo, Ching-tsan; Miller, Joe Jed; and Cywinski, Norbert Francis, 3,907,919.

Miller, Laurence G., to Rank Xerox Ltd. Sensing sheets on a support surface. 3,907,283, Cl. 271-258.000.

Miller, Ralph H. Heavier-than-air freight aircraft having lighter than air gas compartments. 3,907,218, Cl. 244-5.000.

Miller, Timothy A.; and Hansen, Carlo J., to Ralston Purina Company. Pet food product and method for forming same. 3,908,025, Cl. 426-623.000.

Milleson, Joseph P., to Crepaco, Inc. Method of removably marking a container. 3,908,036, Cl. 427-10.000.

Mills, Stacey M.: *See—*
Wilkins, Judd R.; Pearson, Albin O.; and Mills, Stacey M., 3,907,646.

Milne, George A. Aerobic sewage digestion system. 3,907,672, Cl. 210-7.000.

Milotic, Milio, to Milotic, Milio. Transformable footwear. 3,906,646, Cl. 36-2.50C.

Minagawa, Motonobu; Akutsu, Mitsuo; and Nakagawa, Kenichi, to Argus Chemical Corporation. Normally liquid hydrocarbon compositions containing amidatriazales. 3,907,517, Cl. 44-63.000.

Minami, Shunji, to Matsushita Electric Industrial Co., Ltd. Device for varying output voltage. 3,908,135, Cl. 307-237.000.

Minerec Corporation: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Miriani, Leon A. Retractable stairs. 3,906,690, Cl. 52-184.000.

Mita Industrial Company, Ltd.: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,907,567.

Mitchell, Barbara: *See—*
Knight, Michael Horace; Mitchell, Barbara; and Ratcliffe, Maurice James, 3,907,751.

Mitchell, Boris J., to General Motors Corporation. Rotary engine rotor. 3,907,464, Cl. 418-61.00A.

Mitchell, Donald J.: *See—*
Drake, Gerald E.; and Mitchell, Donald J., 3,906,966.

Mitchell S.A.: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Gas Chemical Co., Inc.: *See—*
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Tanaka, Shigeo; Hashimoto, Kazuyoshi; Takatsu, Toshiharu; Abe, Mitsuhiro; Sada, Hidetaki; and Kawanami, Katsusuke, 3,906,767.

Mitsubishi Paper Mills, Ltd.: *See—*
Ueda, Bunzo; Iguchi, Sigeru; Yano, Tetsuo; and Iwata, Tamotu, 3,907,572.

Mitsuhashi, Yoshio. Stapler with a punch mechanism. 3,907,190, Cl. 227-127.000.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Kubota, Takeshi; and Ueda, Mikio, 3,907,662.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Yamamoto, Kosuke, 3,908,051.

Miura, Hitoshi: *See—*
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Miyata, Nobuyoshi; and Nakayama, Hiroyuki, to Kansai Paint Co., Ltd. Photopolymerizable vinylurethane monomer. 3,907,865, Cl. 260-471.00C.

Miyatuka, Hajime: *See—*
Tamai, Yasuo; Miyatuka, Hajime; and Honjo, Satoru, 3,907,693.

Miyazaki, Tsutomu; Kato, Takashi; Suzuki, Yoshihisa; Yoshizawa, Toshio; and Ueda, Shozo, to Daiwa Boseki Kabushiki Kaisha; and Kabushiki Kaisha Toyodo Jidoshokki Siesakusho. Method and apparatus for transferring yarn packages from a textile machine to a carrying device. 3,906,712, Cl. 57-53.000.

Mizuno, Hirokuni: *See—*
Yamagishi, Hidehisa; Mizuno, Hirokuni; Kashiyama, Yoshitaka; and Toyoda, Yasuhiro, 3,907,610.

Mizuno, Masayuki: *See—*
Shimojima, Yukiji; Mizuno, Yukiko; Horiguchi, Sadayuki; Mizuno, Masayuki; Ohoka, Tadaaki; and Takeda, Isao, deceased, 3,907,989.

Mizuno, Yukiko: *See—*
Shimojima, Yukiji; Mizuno, Yukiko; Horiguchi, Sadayuki; Mizuno, Masayuki; Ohoka, Tadaaki; and Takeda, Isao, deceased, 3,907,989.

Mo, Olav. Foundation method for caissons. 3,906,735, Cl. 61-46.500.

Mobil Oil Corporation: *See—*
Baldwin, Willett F., 3,906,780.
Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., 3,907,915.
Owen, Hartley, 3,907,663.
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Willis, James L., Jr.; and Grandio, Philip, Jr., 3,907,914.

Modular Wall Systems, Inc.: *See—*
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Moedritzer, Kurt: *See—*
Wagenknecht, John H.; and Moedritzer, Kurt, 3,907,652.

Moertel, George B., to Textron Inc. Slide fastener. 3,906,595, Cl. 24-205.13C.

Mohawk Data Sciences Corporation: *See—*
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Mohr, Rudolf: *See—*
Liebold, Gert; Oppenlaender, Knut; Buettner, Egon; Fikentscher, Rolf; and Mohr, Rudolf, 3,907,701.

Moline, Kenneth R.: *See—*
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Molitor, Edwin A.: *See—*
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Mollering, Hans; Beaucamp, Klaus; Nelboeck-Hochstetter, Michael; and Bergmeyer, Hans Ulrich, to Boehringer Mannheim G.m.b.H. Creatinine amidohydrolase composition and process for the determination of creatinine. 3,907,644, Cl. 195-99.000.

Molson Companies Limited, The: *See—*
Hodgetts, Ernest J., 3,906,610.

Monarch Marking Systems, Inc.: *See—*
Rosendale, William Lee; and Lakes, Ardyth Dale, 3,908,063.

Monsanto Company: *See—*
Bittle, David F.; and McPeters, Arnold L., 3,907,498.
Blackmon, Lawrence E., 3,907,963.
Dixon, William D.; and Becker, Maureen E., 3,907,937.
Higginbottom, Harold P., 3,907,724.
Markhart, Albert H.; and Santer, James O., 3,907,738.
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Olin, John F., 3,907,544.
Raffelson, Harold; Lee, Roberto; and Dolan, Thomas J., 3,907,707.
Reilly, Joseph R., 3,907,476.
Wagenknecht, John H.; and Moedritzer, Kurt, 3,907,652.

Monsarrat, William G., to United Technologies Corporation. Intermediate compressor case for gas turbine engines. 3,907,455, Cl. 415-68.000.

Montagna, Angelo A.: *See—*
Chun, Sun W.; Hamilton, Harry A.; and Montagna, Angelo A., 3,907,666.

Montagne, Jean Bernard, to Compagnie Generale des Etablissements Michelin. Tire treads made of an oriented elastomer mixture. 3,907,019, Cl. 152-330.00R.

Montecatini Edison S.p.A.: *See—*
Bonvicini, Alberto; Cantatore, Giuseppe; and Balata, Fabrizio, 3,907,935.
Dall'Asta, Gino; and Meneghini, Pietro, 3,907,934.

Monter S.p.A.: *See—*
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Montoya, Marcel. Supersonic printing method and system thereof. 3,907,089, Cl. 197-1.00R.

Moody, Roy A.: *See—*
Caveney, Jack E.; and Moody, Roy A., 3,906,593.

Moore, Harry O., to Combis, Chris, a part interest. Apparatus for dispensing articles such as newspapers and the like. 3,907,160, Cl. 221-84.000.

Moore, Richard L.: *See—*
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Moran, John Christian: *See—*
Hight, Stuart Lee, deceased; Hight, Nancy C., executrix; Moran, John Christian; and Tsao-Wu, Nelson Tsin, 3,908,092.
Moran, Norman P. Automatic multi-visual control system. 3,907,419, Cl. 353-94.000.
Moreland, James P. Dynamically variable tennis racket. 3,907,292, Cl. 273-73.00C.
Morell, Josef; and Nowak, Johann, to Vockenhuber, Karl; and Hauser, Raimund. Strip-feeding mechanism for motion-picture projectors and the like. 3,907,413, Cl. 352-79.000.
Morgan, Ronald Wade; and Witherspoon, David L. Cutting apparatus for making draperies, curtains, awnings, and the like. 3,906,824, Cl. 83-81.000.
Morgan, Veldon. Horse tie down. 3,906,707, Cl. 54-35.000.
Moriarity, Jack: *See—*
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Moriarty, Frederic J., to Barry Wright Corporation. Visible record storage system. 3,907,390, Cl. 312-303.000.
Morimoto, Akio: *See—*
Kumabe, Hirohide; Morimoto, Akio; Kitagawa, Yozo; and Shiraishi, Nobuhide, 3,907,928.
Morimoto, Tatsuo: *See—*
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Morinaga Milk Industry Co., Ltd.: *See—*
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Morino, Ikuo; and Makihara, Minoru, to Nippon Paint Co., Ltd. Spray type apparatus for treatment of metal surface. 3,906,895, Cl. 118-326.000.
Morris, Charles R.: *See—*
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Morse, David V., to Carborundum Company, The. Molten metal superheater and method of using the same. 3,907,491, Cl. 432-28.000.
Moser, Karl: *See—*
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Moss, Sidney Noel Victor; and Ryder, Neville Theodore, to Serck Industries Limited. Tubular heat exchangers. 3,907,030, Cl. 165-162.000.
Mostow, John H., to Colgate-Palmolive Company. Process for making a free flowing soap-nonionic detergent. 3,907,702, Cl. 252-370.000.
Motlong, Bruce D.: *See—*
Davis, Delles T.; and Motlong, Bruce D., 3,907,168.
Motoren Forschungs GmbH & Co. KG Franken Motoren: *See—*
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Motorola, Inc.: *See—*
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Marley, Robert R.; and Seelbach, Walter C., 3,908,162.
Wilcox, Milton E., 3,908,171.
Zwernemann, Ross, 3,907,617.
Mottram, Charles P., to National Distillers and Chemical Corporation. Combined valve and pressure indicator for pneumatic tires. 3,906,988, Cl. 137-227.000.
Moulinex, Societe Anonyme: *See—*
Mantelet, Jean, 3,907,215.
Mudd, Patrick J.: *See—*
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Mueller, George E., to Bethlehem Steel Corporation. Rolling mill control method and apparatus. 3,906,764, Cl. 72-8.000.
Mueller, Wolfgang: *See—*
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Muhlhauser, Helmut: *See—*
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Muirhead, Leslie A., to Shell Oil Company. Coated particulate vinyl aromatic polymers. 3,908,069, Cl. 428-407.000.
Mulders, Julien; and Vanlautem, Noel, to Solvay & Cie. Process for the additive chlorination of α-unsaturated carboxylic acids and esters. 3,907,655, Cl. 204-158.0HA.
Muller, Friedhelm: *See—*
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Muller, Gerd, to Jenaer Glaswerk Schott & Gen. Process of making a partially crystallizable seal. 3,907,535, Cl. 65-33.000.
Muller, Helmut: *See—*
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Muller, Jurgen, to U.S. Philips Corporation. Tone arm suspension for a record changer. 3,907,306, Cl. 274-23.00R.
Muller, Wilfried: *See—*
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Mulliner, David K., to San Diego Gas & Electric Co.; and Dual Fuel Systems, Inc., part interest to each. Apparatus for odorizing liquid natural gas. 3,907,515, Cl. 44-2.000.
Mullings, Donald M., to General Electric Company. Heat exchanger housing. 3,907,050, Cl. 138-157.000.
Multifold-International, Inc.: *See—*
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Stapp, Willis J.; Crowe, Norman P.; and Molitor, Edwin A., 3,907,129.
Murakami, Masuo; Kubo, Kazuo; Arima, Hideki; and Sano, Kenji, to Yamanouchi Parmaceutical Co., Ltd. Cycloalkylaminoarylcarboxylic acid derivatives. 3,907,879, Cl. 260-518.00R.
Murakami, Yoshihiko: *See—*
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Murata, Koichiro: *See—*
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Murata, Masahiro; and Iizuka, Michio, to Hope Kabushiki Kaisha. Toe pieces of safety ski bindings. 3,907,317, Cl. 280-11.35T.
Murayama, Takeshi: *See—*
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Murdock, Bruce K., to General Motors Corporation. Differential amplifying system with forced differential feedback. 3,908,173, Cl. 330-30.00D.
Murdock, Keith Chadwick; and Herndon, Robert Alton, to American Cyanamid Company. Pyridine derivatives of (1-(3-phenanthryl)ethylidene)hydrazine. 3,907,817, Cl. 260-295.00H.
Murphy, Harry C., Jr.; Plundo, Robert A.; Stauffer, Harry C.; Taylor, Herman, Jr.; and Yanik, Stephen J., to Gulf Research & Development Company. Process for producing a lubricating oil from a residue feed. 3,907,667, Cl. 208-210.000.
Murphy, John P., to Lubrizol Corporation, The. Nitrogen-containing compositions useful as rust inhibitors in fuels and lubricants. 3,907,704, Cl. 252-392.000.
Murphy, Patrick W. Windshield cleaning device. 3,906,583, Cl. 15-250.030.
Murrell, Lawrence L.: *See—*
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Murrey, Gordon W. Coin operated pool table. 3,907,286, Cl. 273-11.00C.
Mutty, Paul R., to General Motors Corporation. Fuel tank venting system. 3,907,153, Cl. 220-86.00R.
Myers, Donald W. Portable awning. 3,906,969, Cl. 135-5.00A.
Myers, Robert A.: *See—*
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Nachbur, Hermann; Kern, Joerg; and Maeder, Arthur, to Ciba-Geigy AG. Process for the manufacture of polycondensation products containing phosphorus, the products and their use as flameproofing agents. 3,907,898, Cl. 260-606.50P.
Nachman, Joseph F.: *See—*
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Nagakuni, Masahiko: *See—*
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Nagasako, Isamu: *See—*
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Nagasawa, Taro; and Tomita, Mamoru, to Morinaga Milk Industry Co., Ltd. Method of removing vitamin B_2 from whey. 3,907,777, Cl. 260-211.300.
Nagata, Seiichi: *See—*
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Nagayama, Masuzo: *See—*
Isa, Hiroshi; Tomooka, Hajime; Murakami, Yoshihiko; Karube, Kenji; Inomiya, Takeshi; and Nagayama, Masuzo, 3,907,924.
Nagumo, Michihiko; Yamaguchi, Shigehiro; and Takahashi, Toshihiko, to Nippon Steel Corporation. High-carbon steel suitable for super high tensile strength hard drawn steel wire. 3,907,553, Cl. 75-126.00D.
Nagy, Laszlo, to General Motors Corporation. Oil seal arrangement for a rotary machine. 3,907,469, Cl. 418-142.000.
Naito, Takayuki; Okumura, Jun; and Hoshi, Hideaki, to Bristol-Myers Company. 7-[α-(2-aminomethyl-1,4-cyclohexadienyl)acetamido]-3-heterocyclic-thiomethyl-3-cephem-4-carboxylic acids and salts. 3,907,786, Cl. 260-243.00C.
Nakada, Masahiko; and Matsumoto, Hirofumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fast idle assembly for carburetors having automatic choke. 3,906,911, Cl. 123-119.00F.
Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Choke control system for internal combustion engines. 3,907,944, Cl. 261-39.00R.
Nakada, Masahiko: *See—*
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Nakajima, Nobuo: *See—*
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Nakajima, Shigeo, to Taiheiyo Coal Mining Co., Ltd. Coal breaker combined with longwall drum. 3,907,367, Cl. 299-53.000.

Nakamura, Kazunori; and Sibasaki, Hiromu, to Sumitomo Electric Industries, Ltd. Method and apparatus for applying stress relieving treatment for stranded steel wires. 3,906,711, Cl. 57-34.00R.

Nakamura, Kenya; and Okano, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Labyrinth structure for air outlet of gas turbine engine bearing chamber. 3,907,457, Cl. 415-112.000.

Nakamura, Shizuo: *See—*
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Nakano, Seizo: *See—*
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Nakano, Shinya: *See—*
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Nakao, Masaru: *See—*
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Nakatani, Hiromi: *See—*
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Nakaya, Shintaro: *See—*
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Nakayama, Hiroyuki: *See—*
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Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, to Kyowa Hakko Kogyo Co., Ltd. Process for the production of L-lysine. 3,907,637, Cl. 195-29.000.

Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, to Kyowa Hakko Kogyo Co., Ltd. Process for producing amino acids by fermentation. 3,907,641, Cl. 195-49.000.

Nakayama, Mutumi: *See—*
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Nakayama, Tadayoshi. Apparatus for absorbing or damping vibrations of the ground. 3,906,689, Cl. 52-167.000.

Nakazawa, Masahiko; Nakamura, Shizuo; and Nakayama, Mutumi, to Asahi Denka Kogyo K.K. Non-flammable paper for speaker cones. 3,907,063, Cl. 181-169.000.

Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Anti-inflammatory (2-benzimidazoylthio)alkylamidoximes. 3,907,822, Cl. 260-309.200.

Naruse, Katutoshi; Hasegawa, Kazuhiko; Matsuno, Kazuo; Yomogida, Toshikiko; and Sanpe, Hideyuki, to Toyoda Koki Kabushiki Kaisha. Method and apparatus for monitoring and diagnosing troubles in sequential control operations. 3,908,117, Cl. 235-153.0AK.

Nast, Roland: *See—*
Ley, Kurt; Eholzer, Ulrich; Nast, Roland; Metzger, Karl Georg; and Fritsche, Dieter, 3,908,008.

Nathan, Guy E.; and Varaud, Claude A., to Constructions Navales et Industrielles de la Mediterranee C.N.I.M. Analog to logical system for range measurements incorporating a radar. 3,908,190, Cl. 343-12.00R.

National Distillers and Chemical Corporation: *See—*
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National Engineering Company: *See—*
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National Gypsum Company: *See—*
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Prince, David S., 3,908,059.

National Research Development Corporation: *See—*
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Nault, Jacques. Moving target firing simulator and a method of adjustment of said simulator. 3,907,433, Cl. 356-152.000.

Naumenko, Victor Arsenievich: *See—*
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Neeff, Rutger: *See—*
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Neel, Jean; and Papillon, Bernard, to Societe Rhone-Progil. Dry cleaning various articles. 3,907,496, Cl. 8-142.000.

Neely, James S.; and Thompson, James A., to Procter & Gamble Company, The. Culinary composition containing paramethoxycinnamaldehyde as a flavoring agent and sweetener. 3,908,026, Cl. 426-538.000.

Neely, James S.; and Thompson, James A., to Procter & Gamble Company, The. Soft drink composition containing paramethoxycinnamaldehyde as a flavoring agent and sweetner. 3,908,028, Cl. 426-538.000.

Nelboeck-Hochstetter, Michael: *See—*
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Nelson, Albert W., to Koehring Company. Self-propelled soil stabilizer machine. 3,907,038, Cl. 172-9.000.

Nelson, Merritt J., to Zin-Plas Corporation. Diverter spout. 3,906,990, Cl. 137-359.000.

Nepote, Alain, to Mitchell S.A. Fishing reel with a disengageable one-way pawl and ratchet mechanism. 3,906,816, Cl. 74-575.000.

Netteland, Loyal G.; and Heintz, Clifford E., to A-T-O Inc. Endothermal carbon dioxide absorption. 3,906,945, Cl. 128-191.00R.

Neufeld, Murray J.; and Smotrys, Walter M., to Hughes Aircraft Company. Redundant position and attitude control for spin stabilized devices. 3,907,226, Cl. 244-169.000.

Neuhaus, Herbert M.; Sherman, Jack; Silver, Wallace E.; and Williams, Lloyd A., to United States of America, Navy. Method for shaped charge bomblet production. 3,907,947, Cl. 264-3.00R.

Neuss, Norbert: *See—*
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New England Envelope Manufacturing Co.: *See—*
Hewitt, Edward G., 3,906,843.

Newlon, Robert L.; and Bernstein, Benjamin, to Lawrence Brothers, Inc. Adjustable ornamental gate latch. 3,907,344, Cl. 292-66.000.

Newton, Alwin B., to Borg-Warner Corporation. Air conditioning system utilizing ice slurries. 3,906,742, Cl. 62-332.000.

Newton, Robert E. Wing-type scaffold system. 3,907,066, Cl. 182-112.000.

Nexus, Incorporated: *See—*
Flanagan, William H., 3,907,395.

Nicholson Manufacturing Company: *See—*
Nicholson, Thomas W.; and Jorgensen, Ray B., 3,907,016.

Nicholson, Thomas W.; and Jorgensen, Ray B., to Nicholson Manufacturing Company. Peripheral chipper cutting bit holder. 3,907,016, Cl. 144-172.000.

Nickel, Hubertus: *See—*
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Nicolas, Louis: *See—*
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Nidy, Eldon G.: *See—*
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Nieder, Berthold L. Controllable bi-directional coupling device. 3,907,083, Cl. 192-41.00A.

Nienart, Louis F.; Saunders, Ralph R.; and Jeges, Paul, to Allied Chemical Corporation. Thermoplastic molding compositions. 3,908,038, Cl. 427-27.000.

Nihon Kikaikougyou Kabushiki Kaisha: *See—*
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Nihon Nohyaku Co. Ltd.: *See—*
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Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Waxy crayon or ink-like diazotype developer composition comprising heat transferrable azo coupler and transfer promotor. 3,907,567, Cl. 96-49.000.

Nikitin, Jury Filippovich: *See—*
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Nims, Jerry C.: *See—*
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Nippon Electric Company Limited: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
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Nippon Soda Company, Limited: *See—*
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Nippon Steel Corporation: *See—*
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Nire, Naomichi; and Sakai, Takeo, to Sumitomo Metal Industries Ltd.; and Keihan Rentan Kogyo Co., Ltd. Method of manufacturing formed coke for blast furnaces without causing the fusion of the coke. 3,907,648, Cl. 201-6.000.

Nishina, Shuho: *See—*
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Nissan Kagaku Kogyo Kabushiki Kaisha: *See—*
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Nissan Motor Co., Ltd.: *See—*
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Nitschke, Norman C.: *See—*
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Noguchi, Teruhisa; Hashimoto, Yoshinobu; Uchiyama, Yoshio; and Ueyama, Michio, to Nippon Soda Company, Limited. Germicidal and fungicidal agent and use thereof. 3,908,019, Cl. 424-340.000.
Nohr, Gary Dean; and Bollenbach, Francis Richard, to Sundstrand Corporation. Thermally activated burst disc. 3,906,976, Cl. 137-68.000.
Nomura, Tadaaki: *See*—
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Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,907,641.
Nonaka, Kohhei; Miura, Hitoshi; and Fukushima, Masayoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluid crash sensor. 3,906,802, Cl. 73-516.0LM.
Nonnenmacher, Gerhard: *See*—
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Nonoyama, Takao: *See*—
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Nordon Industries, Inc.: *See*—
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Nordstrom, Cai Gustav Rabbe, to Boehringer Ingelheim GmbH. Indwelling vein catheter with concentric puncture needle. 3,906,946, Cl. 128-214.400.
Norgaard, Richard Arlund; and Nygaard, Sven, to Eskofot A/S Industriparken. Reproduction camera having a control circuit for automatic regulation of the exposure time. 3,907,428, Cl. 355-68.000.
Norprint Limited: *See*—
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Nuclear Power Group Limited, The: *See*—
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Nutmeg Sanitation, Inc.: *See*—
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O'Brien, Darrell E.; Robins, Roland K.; and Simon, Lionel N., to ICN Pharmaceuticals, Inc. Xanthine oxidase inhibitors. 3,907,799, Cl. 260-256.40F.
O'Brien, John W. Atomizing sprayer device. 3,907,207, Cl. 239-415.000.
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Odermatt, Paul, to Maschinenfabrik Schweiter AG. Holding core for yarn spools, pirns, and the like. 3,907,232, Cl. 242-46.200.
O'Doherty, George O. P., to Lilly and Company. Ring-substituted N-(2,2-difluoroalkanoyl)-o-phenylenediamine compounds. 3,907,892, Cl. 260-562.00B.
Oepping, Wilfried, to Kunststoff GmbH. Ornamental grille. 3,906,698, Cl. 52-663.000.
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Ogiso, Koichi. Method of preparing a filter medium for the filtration of molten aluminum or a molten aluminum alloy. 3,907,962, Cl. 264-332.000.
Oglesby, Howard M.; and Smith, Brian R., to Whirlpool Corporation. Disposable skid. 3,907,241, Cl. 248-346.000.
O'Grady, Vincent J., to Monsanto Company. Toughened polymeric polyblend having high flow and ductility. 3,907,930, Cl. 260-876.00B.
Ohara, Takashi; Ueshima, Michio; and Yanagisawa, Isao, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst composition for the preparation of unsaturated carbonyl compounds. 3,907,712, Cl. 252-456.000.
Ohio Nuclear, Inc.: *See*—
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Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Non-elastomeric polyurethane compositions prepared in the presence of a sulphone. 3,907,739, Cl. 260-30.80R.
Omura, Itiro; and Kaneko, Tadao, to Hitachi, Ltd. Crystal growing apparatus. 3,906,889, Cl. 118-5.000.
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Orozco, Hector Mendoza. Portable submachine gun. 3,906,833, Cl. 89-196.000.

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Oswald, Alexis A.; and Murrell, Lawrence L., to Exxon Research and Engineering Company. Silylhydrocarbyl phosphines and related compounds. 3,907,852, Cl. 260-448.20N.
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Otthofer, Jacob A., Jr., to Armstrong Cork Company. Process for forming negatives for chemical etching process. 3,907,622, Cl. 156-58.000.
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Pachmayr Gun Works, Inc.: *See—*
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Paige, Peter M.; and Scherba, Emil S., to Holmes & Narver, Inc. Composite electrode and method of making same. 3,907,659, Cl. 204-290.00F.
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Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., to Stauffer Chemical Company. Certain geranyl phenyl ethers and their epoxides and their use in controlling insects. 3,907,783, Cl. 260-240.00H.
Pamer, Karl A., to McNeil Corporation. Material handling apparatus. 3,906,865, Cl. 104-89.000.
Pampus, Gottfried; Lehnert, Gunther; and Witte, Josef, to Bayer Aktiengesellschaft. Unsaturated polymers containing reactive groups. 3,907,757, Cl. 260-79.30R.
Panametrics, Inc.: *See—*
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Pangborn, Jon B., to American Gas Association, Inc. Thermoelectrochemical process for producing hydrogen and oxygen from water. 3,907,980, Cl. 423-579.000.
Papa, Anthony Joseph; and Proops, William Robert, to Union Carbide Corporation. Flame retardant polyurethanes containing chemically combined 3,4-dibromocyclohexane diols. 3,907,722, Cl. 260-2.5AM.
Papa, John F., Jr., to Evinger Corporation. Band making apparatus. 3,906,768, Cl. 72-22.000.
Papai, Imre F. Pastry shell filling apparatus. 3,906,850, Cl. 99-450.700.
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Parker, Dane K., to Goodyear Tire & Rubber Company, The. Preparation of antioxidant amides. 3,907,893, Cl. 260-562.00R.
Parker, Delmer G., to Xerox Corporation. Corona current measurement and control arrangement. 3,908,164, Cl. 323-75.00K.
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Pasbrig, Max, to Lacrex Brevetti S.A. Break ignition plug and ignition device. 3,908,146, Cl. 313-125.000.
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Paugh, George W., to Ralston Purina Company. Continuous puffing method. 3,908,034, Cl. 426-449.000.
Paul, Bruno; Wilisch, Jurgen; Wimmer, Gunter; and Richter, Volker, to TED Bildplatten Aktiengesellschaft; and AEG-Telefunken-Teldec. Automatic record changing. 3,907,305, Cl. 274-10.00R.
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Pech, Bernard M., to Societe Nationale des Poudres et Explosifs. Safety device with an inflatable cushion which provides effective protection during successive collisions. 3,907,327, Cl. 280-150.0AB.
Pedersen, Bendt Ove; and Bredsted, Ole Jacobsen, to Nordisk Ventilator Co. A/S. Vane with an axle pin for axial impeller wheels. 3,907,460, Cl. 416-168.000.
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Persson, Bengt Arne, to B A Installationsutveckling AB. Valve device for restricting the flow of a liquid by a helical flow passage. 3,907,249, Cl. 251-126.000.
Pesapane, Paolo, to Monter S.p.A. Apparatus adapted for the protective coating of the race between the rim and disc of motor vehicle wheels. 3,906,894, Cl. 118-315.000.
Pesout, Edward, Jr.: *See—*
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Pharris, Jack W. High speed, long range turbo-jet aircraft. 3,907,219, Cl. 244-7.00A.
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Pilgrim, Thomas Albert; Cuin, David Ernest; Wightman, Colin John; and Donovan, John Leslie, to BPB Industries Limited. Partitions. 3,906,695, Cl. 52-489.000.
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Polaroid Corporation: *See—*
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Populin, Peter; Populin, Louis; and Scalia, Guiseppe. Apparatus relating to the orientation of elongated elements. 3,907,135, Cl. 214-83.360.
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Pottier, Michel: *See—*
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Pozelt, Martin; Uebelstadt, Manfred; Dahn, Ahlrich; and Bauer, Karl, to Audi Nsu Auto Union Aktiengesellschaft. Impact-damping system for automotive vehicles. 3,907,351, Cl. 293-71.00R.
PPG Industries, Inc.: *See—*
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Primicerio, Fernando; and Rispoli, Vincenzo, to Minnesota Mining and Manufacturing Company. Container for reeled film or magnetic tape. 3,907,109, Cl. 206-406.000.
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Roberts, Richard R. Surgical cauterizing tool having suction means. 3,906,955, Cl. 128-303.170.
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Runge, Heinz F., to Kraftco Corporation. Apparatus for making dispensers. 3,906,609, Cl. 29-208.00B.

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Rupe, Jack H., to California Institute of Technology. System for minimizing internal combustion engine pollution emission. 3,906,913, Cl. 123-121.000.

Rupnik, Robert F.: *See—*
Kolibar, Richard W.; and Rupnik, Robert F., 3,907,448.

Rushforth, Calvin; and Tine, Sebastian David, to Watts Regulator Company. Swing open cross-connection valve. 3,906,987, Cl. 137-218.000.

Ruskin Manufacturing Company: *See—*
Root, James R., 3,907,020.

Russell, Edward J.; and Tielrooy, Robert W., to Van Dam Machine Corporation of America. Article transfer apparatus. 3,907,095, Cl. 198-25.000.

Russell, Gordon D.; and Roy, Rabindranath, to Johnson & Johnson. Spot-bonded nonwoven fabrics and methods of making the same. 3,908,058, Cl. 428-198.000.

Russell, John Percival: *See—*
Rich, John Theodore; and Russell, John Percival, 3,906,984.

Russin, Nicholas C.: *See—*
Tershansy, Ronald A.; Russin, Nicholas C.; and McFarlane, Finley E., 3,907,754.

Ryder, Neville Theodore: *See—*
Moss, Sidney Noel Victor; and Ryder, Neville Theodore, 3,907,030.

S.K.M.: *See—*
Binoche, Michel, 3,907,202.

Sable, Harvey J., to Addressograph Multigraph Corporation. Electrophotographic reproduction system utilizing ion modulator and dielectric and dielectric imaging surface. 3,907,560, Cl. 96-1.400.

Sack, Werner, Dr.: *See—*
Kiefer, Werner, Dr.; Sack, Werner, Dr.; and Krause, Dieter, Dr., 3,907,577.

Sackman, Lester M., to Bear Brand Hosiery Co. Panty and parts thereof and method of manufacture. 3,906,754, Cl. 66-177.000.

Sackmann, Gunter; Kolb, Gunter; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Additives for paper. 3,907,758, Cl. 260-79.3MU.

Sada, Hidetaki: *See—*
Tanaka, Shigeo; Hashimoto, Kazuyoshi; Takatsu, Toshiharu; Abe, Mitsuhiro; Sada, Hidetaki; and Kawanami, Katsusuke, 3,906,767.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Sperandio, Francis; and Guglieri, Michel, 3,907,602.

Saint-Gobain Industries: *See—*
Meunier, Georges, 3,907,956.

Saito, Kazo; and Kida, Nobutoshi, to Telesco Brophey Limited. Self-opening umbrella. 3,906,970, Cl. 135-22.000.

Sakai, Takeo: *See—*
Nire, Naomichi; and Sakai, Takeo, 3,907,648.

Sakano, Tomiaki; and Takeda, Naoji, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing winding type flat motor armatures. 3,906,622, Cl. 29-597.000.

Sakasegawa, Hiroshi; and Shindome, Yasuo, to Nissan Motor Co., Ltd. Wiring or piping clamp. 3,906,592, Cl. 24-73.0AP.

Sakuma, Hiraku: *See—*
Inoue, Eiichi; Shimizu, Isamu; Sakuma, Hiraku; and Kokado, Hiroshi, 3,907,566.

Saleem, Abdus; and Kopita, Robert, to Peabody Engineering Corporation. High velocity spray scrubber. 3,907,526, Cl. 55-223.000.

Salomon, Georges Pierre Joseph, to S.A. Etablissements Francois Salomon & Fils. Safety fixing devices for skis. 3,907,313, Cl. 280-11.35K.

Salomon, Georges Pierre Joseph. Safety binding for ski boots. 3,907,318, Cl. 280-11.35K.

Samelson, Harold: *See—*
Riseberg, Leslie A.; Samelson, Harold; and Lempicki, Alexander, 3,908,121.

Samyn, Celeste: *See—*
Marvel, Carl S.; Ting-Man Wong, Daniel; Westerman, Ira John; Samyn, Celeste; and Sivaramakrishnan, Parameswar, 3,907,748.

San Diego Gas & Electric Co.: *See—*
Mulliner, David K., 3,907,515.

Sanders, David A., to Minnesota Mining and Manufacturing Company. Liquid crystal display device and method of making. 3,908,052, Cl. 428-1.000.

Sanders, James Milton: *See—*
Hall, John B.; and Sanders, James Milton, 3,907,321.

Sanderson, Dewey S. C. Combination petri dish and isolator. 3,907,647, Cl. 195-139.000.

Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; Tsuchihashi, Takashi; Takasu, Masao; and Ishidoshiro, Hiroshi, 3,906,755.

Sando, Shigeru: *See—*
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; and Sando, Shigeru, 3,908,186.

Sando, Yoshikazu; Tsuchihashi, Takashi; Takasu, Masao; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for a continuous treatment of textile fiber goods. 3,906,755, Cl. 68-3.0SS.

Sandoz Inc.: *See—*
Bacso, Imre; and Galantay, Eugene E., 3,907,844.
Basco, Imre; and Galantay, Eugene E., 3,907,845.
Gabel, Lloyd P.; and Simpson, William R., 3,908,011.
Houlihan, William J.; and Nadelson, Jeffrey, 3,907,878.

Sano, Kenji: *See—*
Murakami, Masuo; Kubo, Kazuo; Arima, Hideki; and Sano, Kenji, 3,907,879.

Sano, Roy Michio; and Kunkel, Fredolin Edward, to Sklar Furniture Limited. Furniture spring. 3,907,266, Cl. 267-102.000.

Sanpe, Hideyuki: *See—*
Naruse, Katutoshi; Hasegawa, Kazuhiko; Matsuno, Kazuo; Yomogida, Toshikiko; and Sanpe, Hideyuki, 3,908,117.

Santer, James O.: *See—*
Markhart, Albert H.; and Santer, James O., 3,907,738.

Santi, Joseph A.: *See—*
Dorff, Donald R.; and Santi, Joseph A., 3,907,465.

Santisi, Harry C., to Selas Corporation of America. Noise suppressor for burner. 3,907,489, Cl. 431-114.000.

Sarkes Tarzian, Inc.: *See—*
Badger, Joe G.; and Valdettaro, Alarico A., 3,906,805.

Sasajima, Kikuo: *See—*
Yamamoto, Hisao; Okamoto, Tadashi; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; and Katayama, Shigenari, 3,907,812.

Sasaki, Kazuyoshi: *See—*
Fujiwara, Taizo; Sasaki, Kazuyoshi; Kimura, Takanori; Nakano, Shinya; Yamaoka, Seiro; and Yamamoto, Koichi, 3,906,700.

Sasame, Takao; and Yagi, Toshio, to Toyo Kogyo Co., Ltd. Method for making ferrous metal having highly improved resistances to corrosion at elevated temperatures and to oxidization. 3,907,611, Cl. 148-6.300.

Sasano, Mitsunori: *See—*
Kobayashi, Nobuyuki; Sasano, Mitsunori; and Nakada, Masahiko, 3,907,945.

Sass, Samuel; Martin, John J.; and Ludemann, William D., Jr., to United States of America, Army. Rapid detection system for benzilates. 3,907,501, Cl. 23-230.00R.

Sasse, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of 1-tert.-butyl-thiosemicarbazide compounds. 3,907,887, Cl. 260-552.0SC.

Satchell, Helen Spence. Boot support device. 3,907,115, Cl. 211-34.000.

Sato, Akira: *See—*
Shiba, Keisuke; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, 3,907,575.

Sato, Mikio; Fujiwara, Hiroshi; and Takahashi, Asao, to Maruzen Oil Company Limited. Process for production of pivalolactone. 3,907,828, Cl. 260-343.900.

Sato, Shigehiko: *See—*
Kimura, Hiroshi; Kusakabe, Kensuke; Sato, Shigehiko; and Nakatani, Hiromi, 3,908,027.

Sato, Takashi, to Kabushiki Kaisha Sato Spring Seisakusho. Method for producing coil springs. 3,906,766, Cl. 72-12.000.

Sato, Takateru; Shiba, Haruo; and Sekine, Masaoki, to TDK Electronics Co., Ltd. Endless tape cartridge. 3,907,234, Cl. 242-55.19A.

Satzinger, Gerhard: *See—*
Hartenstein, Johannes; Satzinger, Gerhard; and Herrmann, Manfred, 3,907,773.
Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, 3,907,826.

Saucy, Gabriel: *See—*
Rosenberger, Michael; and Saucy, Gabriel, 3,907,827.

Saunders, Ralph R.: *See—*
Nienart, Louis F.; Saunders, Ralph R.; and Jeges, Paul, 3,908,038.

Saunders, Richard C., to Rockwell International Corporation. Aluminum electrode. 3,907,590, Cl. 136-6.0LF.

Savage, Donald D., to Powell, B. J., a part interest. Vehicle subassembly. 3,907,053, Cl. 180-6.480.

Savino, Thomas V.: *See*—
Burton, Albert C.; McGraw, William E.; and Savino, Thomas V., 3,907,060.

Saygin, Ferdi, to Therachemie Chemisch Therapeutische Gesellschaft m.b.H. Hair dyes based on diamino-nitro-benzene compounds. 3,907,494, Cl. 8-10.000.

Sbragia, Ronald J.: *See*—
Edamura, Fred Y.; and Sbragia, Ronald J., 3,907,993.

Scaglione, Paul J. Fluid flow control valve. 3,906,997, Cl. 137-614.160.

Scales, Julian Thomas, to Imperial Group Limited. Impregnation of a travelling web. 3,906,893, Cl. 118-63.000.

Scalia, Guiseppe: *See*—
Populin, Peter; Populin, Louis; and Scalia, Guiseppe, 3,907,135.

Scanio, Charles J. V., to Pfizer, Inc. Preparation of alpha-6-deoxy-5-hydroxytetracycline. 3,907,890, Cl. 260-559.0AT.

Schaefer, Donald W.; and Woods, John W., to International Business Machines Corporation. Dimensionally stable film mounting. 3,906,649, Cl. 40-10.00R.

Schaefer, Hugh Ferdinand, to Union Carbide Corporation. Vinyl battery separators. 3,907,601, Cl. 136-131.000.

Schaller, Hans Achim; Reinhardt, Gunter; and Zenger, Dieter, to Ernst Plank KG. Film projector with sound. 3,907,412, Cl. 352-11.000.

Schaller, Pierre Andre, to Application des Gaz. Portable pressure gas apparatus superposed on a vertical axis-container. 3,907,490, Cl. 431-142.000.

Schaschel, Erich T., to Owens-Illinois, Inc. Reaction products of silicon monoxide and conjugated dienes and methods of making the same. 3,907,747, Cl. 260-46.50R.

Schaschel, Erich T., to Owens-Illinois, Inc. Reaction products of silicon monoxide and olefins and methods of making the same. 3,907,750, Cl. 260-46.50R.

Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; by Garyaev, Nina Andreevna, administrator; and by Garyaeva, Marina Andreevna, administrator. Machine for application of powderlike material onto lining or surface of structure. 3,907,170, Cl. 222-135.000.

Schellenberg, Dietmar; and Bent, Richard L., to Eastman Kodak Company. Di-p-toluenesulfonic acid salt of N-ethyl-N-methoxyethyl-3-methyl 1,4 benzenediamine. 3,907,875, Cl. 260-501.190.

Schenck Corporation: *See*—
Schenck, George E.; Schenck, Robert L.; and Senft, Frank W., 3,906,825.

Schenck, George E.; Schenck, Robert L.; and Senft, Frank W., to Schenck Corporation. Belt shearline having metering roller. 3,906,825, Cl. 83-155.100.

Schenck, Robert L.: *See*—
Schenck, George E.; Schenck, Robert L.; and Senft, Frank W., 3,906,825.

Schenk, Stanley A.; and Bugg, William S. Safety sleeping arrangement. 3,906,556, Cl. 5-10.00R.

Schera, Enos L., Jr. Linear adjustable telescopic nipple. 3,907,334, Cl. 285-20.000.

Scherba, Emil S.: *See*—
Paige, Peter M.; and Scherba, Emil S., 3,907,659.

Schering Aktiengesellschaft: *See*—
Itil, Turan M.; Herrmann, Werner Martin; Horowski, Reinhard; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gerd; and Wachtel, Helmut, 3,908,007.
Puttner, Reinhold; and Arndt, Friedrich, 3,907,861.

Schering Corporation: *See*—
Weinstein, Marvin J.; Luedemann, George M.; and Wagman, Gerald H., 3,907,771.

Schermerhorn, Jerry D., to Owens-Illinois, Inc. Method of and system for introducing logic into display/memory gaseous discharge devices by spatial discharge transfer. 3,908,151, Cl. 315-169.0TV.

Scherrer, Claude-Jacques; Mauleon, Jean-Louis; and Gmerek, Jean-Daniel, to Compagnie Francaise de Raffinage; and Universal Oil Products Company, part interest to each. Compositions for inhibiting the corrosion of metals. 3,907,578, Cl. 106-14.000.

Schexnayder, Lawrence F., to Caterpillar Tractor Company. Relief valve dampening device. 3,906,839, Cl. 91-418.000.

Schinner, Edward N.: *See*—
Bradley, Wilson E., Jr.; and Schinner, Edward N., 3,907,942.

Schliebs, Reinhard: *See*—
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert Rudolf; and Eue, Ludwig, 3,907,540.

Schloemann-Siemag Aktiengesellschaft: *See*—
Fritz, Manfred, 3,906,827.
Simons, Willi; Grothe, Horst; Haselhuhn, Rolf; Koenig, Peter; and Brock, Klaus, 3,907,022.

Schlumberger, Etienne: *See*—
de Jerphanion, Louis-Gabriel; and Schlumberger, Etienne, 3,906,973.

Schlumberger Instruments et Systemes: *See*—
Merle, Jean Pierre; and Pavie, Claude, 3,907,230.

Schmidt, John Philip: *See*—
Harvey, Robert Joseph; Kollar, John; and Schmidt, John Philip, 3,907,874.

Schmidt, Maureen Randall: *See*—
Fischer, Joseph Bernard; Ito, Roy Atsushi; Ross, Walter Lee; Schmidt, Maureen Randall; and Stoddard, Stanley Ward, 3,907,290.

Schmidt, Robert Rudolf: *See*—
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert Rudolf; and Eue, Ludwig, 3,907,540.

Schmidt, Thomas W., to Phillips Petroleum Company. Tank cars. 3,906,995, Cl. 137-575.000.

Schmiedel, Sabine: *See*—
Schweig, Dieter; and Schmiedel, Sabine, 3,908,035.

Schmitt, Werner: *See*—
Purrmann, Robert; Schmitt, Werner; Jochum, Peter; and Grimm-Lenz, Rainer, 3,907,106.

Schmutz, Jean; and Hunziker, Fritz, to Wander, A., Dr. Basically substituted heterocycles as anti-emetics. 3,908,010, Cl. 424-250.000.

Schnaibel, Eberhard: *See*—
Fleischer, Helmut; Domann, Helmut; Maisch, Wolfgang; and Schnaibel, Eberhard, 3,907,380.

Schnall, Gunther: *See*—
Eppe, Rudolf; Schnall, Gunther; Schott, Walter; Bronner, Hermann; and Ettelbruck, Rudiger, 3,907,422.

Schneider, Horst: *See*—
Weber, Klaus; Hell, August; and Schneider, Horst, 3,907,110.

Schneider, Jean-Claude, to Fabrique d'Horlogerie Chs. Tissot et Fils S.A. Watch escapement. 3,906,714, Cl. 58-115.000.

Schneider, William P., to Upjohn Company, The. Extract containing prostaglandins. 3,907,871, Cl. 260-488.00R.

Schnoes, Heinrich K.: *See*—
De Luca, Hector F.; Schnoes, Heinrich K.; and Lam, Hing-Yat, 3,907,843.

Schoepe, Adolf. Irrigation pipe and coupling construction. 3,907,341, Cl. 285-236.000.

Schofield, John Michael Stuart: *See*—
Hall, Raymond Frederick; Schofield, John Michael Stuart; Smith, James; and Short, Jeffrey Charles Merrell, 3,908,147.

Schofield, Norman W.: *See*—
Dorrance, William T.; and Schofield, Norman W., 3,906,565.

Schon, Otmar, to Hydac, Gesellschaft fur Hydraulik-Zubehor. Hydraulic system. 3,906,994, Cl. 137-544.000.

Schorsch, John B.; Graul, William E.; and Barash, David, to Union Corporation, The. Refrigeration apparatus having a rotatable drum. 3,906,743, Cl. 62-374.000.

Schosek, William O. Pipe guide means for a rod and pipe pusher. 3,907,253, Cl. 254-29.00R.

Schott, Walter: *See*—
Eppe, Rudolf; Schnall, Gunther; Schott, Walter; Bronner, Hermann; and Ettelbruck, Rudiger, 3,907,422.

Schreck, Harold J.: *See*—
Rockerath, John L.; and Schreck, Harold J., 3,906,877.

Schreiber, William Lewis; Vock, Manfred; Hall, John B.; Shuster, Edward Joseph; and Quinn, Alton Dewitt, to International Flavors & Fragrances Inc. Imparting cinnamon-like flavor with certain 3-phenyl pentenal acetals. 3,908,023, Cl. 426-536.000.

Schroder, Christian: *See*—
Poter, Hans; and Schroder, Christian, 3,906,696.

Schroeder, Guenter: *See*—
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, 3,907,882.

Schroeder, Larry A., to Swift & Company. Complete feed product for prevention of milk fever in dairy cows. 3,908,020, Cl. 426-2.000.

Schubach, Theodor C., to Rohr Industries, Inc. Blind, riveted joint for panel members. 3,906,694, Cl. 52-471.000.

Schug, Gerd: *See*—
Regner, Richard; and Schug, Gerd, 3,907,003.

Schuler, Howard M., to Tyrechek Inc. Valve mounted pneumatic tire pressure sensing switch. 3,908,105, Cl. 200-61.250.

Schulte, Sheldon R.: *See*—
Robin, Michael; and Schulte, Sheldon R., 3,907,939.

Schultz, Donald F., Jr., to Ethyl Development Corporation. Apparatus for separating plastic containers. 3,906,821, Cl. 82-79.000.

Schumacher, John C., to J. C. Schumacher Co. Instrument for detecting the plastic flow point of a metal. 3,906,783, Cl. 73-94.000.

Schupack, Morris. Segmental precast concrete post-tensioned overpass bridges with cantilevered abutment. 3,906,687, Cl. 52-87.000.

Schurmann, Hans: *See*—
Graf, Felix; Ruegg, Albert; Guldenfels, Dieter; and Schurmann, Hans, 3,907,217.

Schwab, Dennis J.: *See*—
Thompson, Clifford T.; and Schwab, Dennis J., 3,906,564.

Schwaner, Jon M.: *See*—
Davenport, Larry C.; Layne, Harold W.; and Schwaner, Jon M., 3,907,194.

Schwartz, Arthur: *See*—
Weant, Charles M.; and Schwartz, Arthur, 3,907,051.

Schweig, Dieter; and Schmiedel, Sabine, to Siemens Elektrogerate GmbH. Method of roasting meat. 3,908,035, Cl. 426-523.000.

Schwend, Fred N.: *See*—
Werner, Wilfred M., 3,907,293.

Schwieter, Ulrich: *See*—
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,908,000.

Schwing, Charles E.; and Campbell, Kenneth B. Locking cane bolt for gates and the like. 3,906,759, Cl. 70-128.000.

Sciara, Frank: *See*—
Zurit, David; and Sciara, Frank, 3,906,986.

SCM Corporation: *See—*
de Souza, Antonio, 3,907,656.
Scott, James N.: *See—*
Scott, Nathaniel C.; and Scott, James N., 3,906,555.
Scott, Nathaniel C.; and Scott, James N. Disposable liner. 3,906,555, Cl. 4-112.000.
Scott Paper Company: *See—*
Robie, Susan P., 3,907,570.
Scrider, Michael Stanley: *See—*
Levy, Stephen David; Poeschel, Gordon Paul; and Scrider, Michael Stanley, 3,907,936.
Seager, Richard H.: *See—*
Richard, Carl E.; and Seager, Richard H., 3,908,100.
Seckinger, Ernst, to Reishauer AG. Apparatus for the delivery and removal of palettes provided with work-pieces on machine tools. 3,907,125, Cl. 214-1.00B.
Seegall, Manfred I.: *See—*
Compton, William A.; Nachman, Joseph F.; and Seegall, Manfred I., 3,907,714.
Seelbach, Walter C.: *See—*
Marley, Robert R.; and Seelbach, Walter C., 3,908,162.
Seidel, William B., to Babcock & Wilcox Company, The. Machine tool. 3,906,681, Cl. 51-165.920.
Seifert, Walter F.: *See—*
Jackson, Larry L.; Seifert, Walter F.; and Collins, Daniel E., 3,907,696.
Seike, Helmut K., to Eltra Corporation. Unitized breaker point and chip capacitor assembly. 3,908,102, Cl. 200-19.00A.
Seki, Tunekatu: *See—*
Arimoto, Heiji; Goto, Tokuji; Amemiya, Kunio; and Seki, Tunekatu, 3,906,757.
Sekine, Masaoki: *See—*
Sato, Takateru; Shiba, Haruo; and Sekine, Masaoki, 3,907,234.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Shiota, Akihiro; Okabe, Atsuo; and Okada, Hideo, 3,907,482.
Selander, Stig, to Defibrator AB. Method of fiber board article production employing predrying of the ligno-cellulosic material prior to liquid suspension and article formation, and employing water recirculation. 3,907,630, Cl. 162-13.000.
Selas Corporation of America: *See—*
Santisi, Harry C., 3,907,489.
Selleck, George L. Non-saturable bun. 3,908,022, Cl. 426-27.000.
Sellstedt, John H.: *See—*
Teller, Daniel M.; and Sellstedt, John H., 3,907,787.
Selmeczi, Joseph G., to Dravo Corporation. Process for the removal of oxides of sulfur from a gaseous stream. 3,907,970, Cl. 423-242.000.
Sendzimir, Tadeusz. Process for the production of bi-metallic sheets. 3,906,618, Cl. 228-118.000.
Senes, Michel; Lhonore, Pierre; Pottier, Michel; and Quibel, Jacques, to Societe Chimique de la Grande Paroisse et Produits Chimiques. Catalytic oxidation of ammonia. 3,907,975, Cl. 423-404.000.
Senft, Frank W.: *See—*
Schenck, George E.; Schenck, Robert L.; and Senft, Frank W., 3,906,825.
Senghaas, Karl A.: *See—*
Hudson, Donald C.; Morris, Charles R.; Fleck, Horst G.; and Senghaas, Karl A., 3,908,126.
Serck Industries Limited: *See—*
Moss, Sidney Noel Victor; and Ryder, Neville Theodore, 3,907,030.
Seres, David A.: *See—*
Birk, John R.; Kelley, Robert B.; and Seres, David A., 3,907,180.
Seth, Pyare Lal, to Hoffmann-La Roche Inc. Pharmaceutical preparations. 3,907,983, Cl. 424-35.000.
Setser, Ronald H.: *See—*
Smith, Philip A.; and Setser, Ronald H., 3,907,081.
Shackford, Ernest B., to General Electric Company. Key operated demand meter cover reset mechanism. 3,908,166, Cl. 324-103.00R.
Shafer, Kenneth A., to Lawrence Peska Associates, Inc., a part interest. Chock-lock block. 3,907,072, Cl. 188-32.000.
Shaffer, Donald Edward, to Du Pont de Nemours, E. I., and Company. Quenching process for melt extruded filaments. 3,907,957, Cl. 264-176.00F.
Shaffer, Frank E. Method for securing cable puller connector to a cable. 3,906,619, Cl. 29-517.000.
Shah, Bankim R.: *See—*
Kuhn, Lawrence; Myers, Robert A.; Pennington, Keith S.; and Shah, Bankim R., 3,907,429.
Shakhlin, Vladimir Ilich: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.
Shank, Raymond S.: *See—*
Kennedy, Alice W.; Shank, Raymond S.; and Wardlow, Eddie, Jr., 3,907,932.
Shaw, Daniel J. C., to International Harvester Company. Steering systems for tracklaying vehicles. 3,907,052, Cl. 180-6.700.
Shaw, Howard G. Safety container. 3,907,103, Cl. 206-1.500.
Shearer, David: *See—*
Shearer, David, Sr.; and Shearer, David, 3,907,183.
Shearer, David, Sr.; and Shearer, David. Bicycle-mounted baseball bat and ball carrier. 3,907,183, Cl. 224-32.000.
Sheinberg, Haskell, to United States of America, Energy Research and Development Administration. Controlled porosity filter and uniform structure composites. 3,907,513, Cl. 29-191.200.
Shelby, Robert L., to Caterpillar Tractor Company. Sealed trunnion bearing assembly. 3,907,383, Cl. 308-3.500.
Sheldon, Gary S.; and Shen, Peter S., to General Electric Company. High voltage power transistor and method for making. 3,908,187, Cl. 357-81.000.
Shell Oil Company: *See—*
Gwyn, John E.; Baldwin, Lisle L.; and Brodhead, Howard, 3,907,661.
Holler, Howard V., 3,908,002.
Muirhead, Leslie A., 3,908,069.
Roman, Steven A., 3,907,790.
Stanton, Benjiman D.; and Goolsby, Alvin D., 3,907,388.
Vernon, Brian J.; and Skoroszewski, Wladyslaw H., 3,907,478.
Shema, Bernard F.; and Brink, Robert H., Jr., to Betz Laboratories, Inc. Slime control compositions and their use. 3,908,030, Cl. 424-270.000.
Shen, Peter S.: *See—*
Sheldon, Gary S.; and Shen, Peter S., 3,908,187.
Shepherd, Alan Arthur: *See—*
Jackson, Sydney; and Shepherd, Alan Arthur, 3,908,075.
Shepovalov, Vyacheslav Dmitrievich; Federov, Alexandr Vasilievich; Puzankov, Anatoly Grigorievich; Khmyrov, Viktor Alexeevich; Delokas, Eduard Petrovich; Agafonov, Igor Danilovich; Bataev, Evgeny Ivanovich; and Khabatov, Boris Shugaibovich. Automatic machine for classifying eggs into weight categories. 3,907,112, Cl. 209-121.000.
Sheppard, Richard H. Power steering gear with torsion rod valve centering mechanism. 3,906,837, Cl. 91-378.000.
Sherborne, Michael C.: *See—*
Bendall, Dennis M.; Harris, William R.; Kew, Jeffrey; Sherborne, Michael C.; and Jones, John A., 3,907,280.
Sherman, Jack: *See—*
Neuhaus, Herbert M.; Sherman, Jack; Silver, Wallace E.; and Williams, Lloyd A., 3,907,947.
Sherwin-Williams Company, The: *See—*
Shields, Robert G.; Blower, Warren A.; and Hatch, Edmond K., 3,907,024.
Sherwood Medical Industries Inc.: *See—*
Ranford, Alan B.; and Joslin, Joel A., 3,907,100.
Shiba, Haruo: *See—*
Sato, Takateru; Shiba, Haruo; and Sekine, Masaoki, 3,907,234.
Shiba, Keisuke; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsion. 3,907,575, Cl. 96-124.000.
Shieh, Ming K., to Dresser Industries, Inc. Stator core and armature core for a vibrating motor. 3,908,138, Cl. 310-29.000.
Shields, Martin A.: *See—*
Lewis, Richard L.; Ewald, Jerome T.; and Shields, Martin A., 3,907,375.
Shields, Robert G.; Blower, Warren A.; and Hatch, Edmond K., to Sherwin-Williams Company, The. Matchplate molding machine. 3,907,024, Cl. 164-212.000.
Shigaki, Seiichiro; Iijima, Hiroshi; and Kaneko, Haruo, to Nippon Electric Company Limited. Predictive conversion between self-correlated analog signal and corresponding digital signal according to digital companded delta modulation. 3,908,181, Cl. 340-347.0AD.
Shikamori, Tamotu; and Hasegawa, Eiichi, to Hitachi, Ltd. Clutch and brake for a washing machine. 3,907,082, Cl. 192-12.0BA.
Shim, Kyung S.: *See—*
Davis, Kenneth E.; and Shim, Kyung S., 3,907,858.
Shimamoto, Noboru: *See—*
Tanaka, Yasuhisa; Shimamoto, Noboru; and Yokokawa, Kiyoshi, 3,907,742.
Shimizu, Isamu: *See—*
Inoue, Eiichi; Shimizu, Isamu; Sakuma, Hiraku; and Kokado, Hiroshi, 3,907,566.
Shimojima, Yukiji; Mizuno, Yukiko; Horiguchi, Sadayuki; Mizuno, Masayuki; Ohoka, Tadaaki; and Takeda, Isao, deceased (by Takeda, Emiko, legal representative), to Asahi Kasei Kogyo Kabushiki Kaisha. Novel antibiotic No. 1998 and process for producing the same. 3,907,989, Cl. 424-118.000.
Shindome, Yasuo: *See—*
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Shinetsu Chemical Company: *See—*
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Shinshu Seiki Kabushiki Kaisha: *See—*
Gomi, Yoshifumi, 3,906,854.
Shionogi & Company,: *See—*
Kano, Hideo; Ogata, Masaru; and Yukinaga, Hisajiro, 3,907,542.
Shiota, Akihiro; Okabe, Atsuo; and Okada, Hideo, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Rotational molding apparatus. 3,907,482, Cl. 425-435.000.
Shiraishi, Nobuhide: *See—*
Kumabe, Hirohide; Morimoto, Akio; Kitagawa, Yozo; and Shiraishi, Nobuhide, 3,907,928.
Shirakusa, Hiroshi: *See—*
Hiraki, Hisao; Hasegawa, Seiro; and Shirakusa, Hiroshi, 3,908,083.

Shirasu, Kazuo; Matsushita, Sachio; Hatano, Tadao; and Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Process for regenerating blixing solution for color photographic processing. 3,907,568, Cl. 96-60.0BF.

Shirey, John E.: *See—*
Hazy, Andrew C.; Shirey, John E.; and Ramins, Lothar, 3,907,569.

Short, Jeffrey Charles Merrell: *See—*
Hall, Raymond Frederick; Schofield, John Michael Stuart; Smith, James; and Short, Jeffrey Charles Merrell, 3,908,147.

Shotmeyer, Albert. Device to indicate the contents in an underground liquid containing tank. 3,906,794, Cl. 73-300.000.

Shreve, Eldon L., to Binks Manufacturing Company. Spray gun with auxiliary spray attachment. 3,907,205, Cl. 239-307.000.

Shriver, Seymour L.: *See—*
Armour, Roland L.; and Shriver, Seymour L., 3,906,637.

Shunin, Timofei Grigorievich: *See—*
Schedrin, Ivan Vasilievich; Shakhlin, Vladimir Ilich; Freidenberg, Anatoly Samuilovich; Ovchinnikov, Gennady Elizarovich; Trifonov, Alexei Grigorievich; Melnikov, Fedor Timofeevich; Filatov, Andrei Dmitrievich; Gazhur, Vladimir Fedorovich; Shunin, Timofei Grigorievich; Privalov, Mikhail Moiseevich; Konovalov, Anatoly Ivanovich; Garyaev, Andrei Lvovich, deceased; Garyaev, Nina Andreevna, administrator; and Garyaeva, Marina Andreevna, administrator, 3,907,170.

Shunney, Edward L.: *See—*
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Shuster, Edward J.: *See—*
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Light, Kenneth K.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred Hugo, 3,907,908.

Shuster, Edward Joseph: *See—*
Schreiber, William Lewis; Vock, Manfred; Hall, John B.; Shuster, Edward Joseph; and Quinn, Alton Dewitt, 3,908,023.

Sibasaki, Hiromu: *See—*
Nakamura, Kazunori; and Sibasaki, Hiromu, 3,906,711.

Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., to General Signal Corporation. Occupancy detector for vehicle control systems. 3,907,238, Cl. 246-34.00R.

Sickinger, Kurt: *See—*
Harle, Hermann; Eisenmann, Siegfried; and Sickinger, Kurt, 3,907,470.

Sieg, Robert Paul; and White, Robert James, to Chevron Research Company. Gasification of solid carbonaceous materials to obtain high BTU product gas. 3,907,519, Cl. 48-202.000.

Siegfried, George. Footlets, pantyhose and protective bag therefor. 3,906,753, Cl. 66-170.000.

Siegmund, Werner, to Hansen Neuerburg, Export-Import GmbH. Pipe line with a safety equipment for transporting pumpable mediums. 3,907,336, Cl. 285-93.000.

Siemens Aktiengesellschaft: *See—*
Engl, Alfred; Marth, Kurt; and Stoever, Peter, 3,908,041.
Klein, Heinrich; and Weber, Eduard, 3,907,029.
Krampe, Dietrich; and Linden, Wilhelm, 3,908,132.
Kraupa, Werner, 3,906,904.
Stut, Hans; and Stiegler, Hans Leo, 3,908,077.

Siemens Elektrogerate GmbH: *See—*
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Sien Equipment Company: *See—*
Sien, Gerald Bruce, 3,907,356.

Sien, Gerald Bruce, to Sien Equipment Company. Mine vehicle and method of fabrication. 3,907,356, Cl. 296-28.00F.

Sigmatron, Inc.: *See—*
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Signetics Corporation: *See—*
Lehrer, Norman B.; and Peterson, David R., 3,908,148.

Silver, Wallace E.: *See—*
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Silvestri, Anthony J.: *See—*
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Simek, Antonin: *See—*
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Simkus, Vyto: *See—*
Jesevich, John; and Simkus, Vyto, 3,907,154.

Simmons, Edward George, to PLC Engineering Company Limited. Sliding plug door gear. 3,906,668, Cl. 49-212.000.

Simon, Lionel N.: *See—*
O'Brien, Darrell E.; Robins, Roland K.; and Simon, Lionel N., 3,907,799.

Simons, Willi; Grothe, Horst; Haselhuhn, Rolf; Koenig, Peter; and Brock, Klaus, to Schloemann-siemag Aktiengesellschaft; and Concast AG, part interest to each. Method of handling and replacing pouring tubes of a continuous casting apparatus. 3,907,022, Cl. 164-82.000.

Simpson, Doyle E.: *See—*
Strickland, Bobby L.; and Simpson, Doyle E., 3,906,962.

Simpson, William R.: *See—*
Gabel, Lloyd P.; and Simpson, William R., 3,908,011.

Sims, Dewey M., Jr. Diver's life line reel. 3,907,236, Cl. 242-85.100.

Singer Company, The: *See—*
Duncan, Avery A., Jr., 3,908,139.
Fitton, Nigel S., 3,906,876.

Singh, Kanwal N.: *See—*
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Singleton, Alan H.: *See—*
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Sioux Steam Cleaner Corporation: *See—*
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Sivaramakrishnan, Parameswar: *See—*
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Skarbo, Roald R., to Kennecott Copper Corporation. Nickel extraction and stripping using oximes and ammoniacal carbonate solutions. 3,907,966, Cl. 423-139.000.

SKF Industrial Trading and Development Company B.V.: *See—*
Gob, Walter, 3,906,675.

Skibo, Phillip M., to Northwest Engineering Company. Tunneling machine. 3,907,093, Cl. 198-10.000.

Skillings, Thomas L. Shower equipment with liquid dispenser for shower head. 3,907,203, Cl. 239-314.000.

Skinner, Dean W., to International Business Machines Corporation. Wafer circuit package. 3,908,155, Cl. 317-100.000.

Sklar Furniture Limited: *See—*
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Skoroszewski, Wladyslaw H.: *See—*
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Slinkard, William E.; and Hughes, Michael P., to Celanese Corporation. Process for oxidizing a hydrocarbon to maleic anhydride and acetic acid. 3,907,833, Cl. 260-346.800.

Small, Bernard J. Apparatus and process for forming tubular bodies. 3,907,102, Cl. 198-285.000.

Smith, Alexander M., II, to Fiberwoven Corporation, The. Method for producing a needled fabric having improved fiber entanglement. 3,906,599, Cl. 28-72.20R.

Smith, Alexander M., II, to Fiberwoven Corporation, The. Fabric with thin surface matrix and method for production thereof. 3,908,057, Cl. 428-151.000.

Smith, Arthur J. Feeder for headed objects. 3,907,099, Cl. 198-220.0BC.

Smith, Brian R.: *See—*
Oglesby, Howard M.; and Smith, Brian R., 3,907,241.

Smith, Claude A.; and Williams, Donald L., to General Motors Corporation. Locking filler cap. 3,907,155, Cl. 220-210.000.

Smith, Colin William: *See—*
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 3,907,846.

Smith, Daniel R.: *See—*
Humphreys, Alan K.; Smith, Daniel R.; and Webb, Edward H., 3,906,776.

Smith, Donald R., to Dennison Manufacturing Company. Curable decorating systems for glass or metal containers. 3,907,974, Cl. 428-346.000.

Smith, Donald R.: *See—*
Liu, Gordon Y. T.; Smith, Donald R.; and Bridges, Robert D., 3,907,760.

Smith, Eugene C., to First Round Research, Inc. Penetration resistant projectile and cartridge for conventional firearms. 3,906,859, Cl. 102-41.000.

Smith, Hal Lee: *See—*
Campbell, Robert L., Jr.; and Smith, Hal Lee, 3,906,615.

Smith, James: *See—*
Hall, Raymond Frederick; Schofield, John Michael Stuart; Smith, James; and Short, Jeffrey Charles Merrell, 3,908,147.

Smith, John H.: *See—*
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Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and White, George Raymond, 3,908,014.

Smith, Lester L. Alignment and retention hardware for folding doors. 3,907,021, Cl. 160-118.000.

Smith, Philip A.; and Setser, Ronald H., to B. F. Goodrich Company, The. Mounting arrangement for a caliper brake. 3,907,081, Cl. 188-73.300.

Smith, William W.; and Alfred, Lawrence W., to Anderson, Robert R.; and Smith, William W., part interest to each. Combined mop and brush attachment. 3,906,580, Cl. 15-115.000.

Smith, Willis R.: *See—*
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SmithKline Corporation: *See—*
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Van Hoeven, Helene E. Bowman; Brenner, L. Martin; and Loev, Bernard, 3,907,814.

Smotrys, Walter M.: *See—*
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Smyth, Michael P.: *See—*
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Snyder, William Lee: *See—*
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Societe a Responsabilite Limitee: Societe Francaise de Stockage Geologique"GEOSTOCK": *See—*
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Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See*—
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S.A. Des Anciens Etablissements Paul Wurth: *See*—
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Societe Anonyme dite: L'oreal: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,907,840.
S.A. Etablissements Francois Salomon & Fils: *See*—
Salomon, Georges Pierre Joseph, 3,907,313.
Societe Anonyme Francaise du Ferodo: *See*—
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Societe Anonyme: Glaenzer Spicer: *See*—
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Societe Chimique de la Grande Paroisse et Produits Chimiques: *See*—
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Societe des Etablissements Andouart: *See*—
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Societe Nationale des Poudres et Explosifs: *See*—
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Societe Rhone-Progil: *See*—
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Societe Technique et Commercial d'Installations Industrielles "Luceat": *See*—
Chevallier, Daniel Marcel, 3,906,974.
Soderquist, Frederick John; Wazbinski, Theodore Thaddeus; and Waldman, Nathan, to Dow Chemical Company, The. Dehydrogenation of alkyl aromatic hydrocarbons. 3,907,916, Cl. 260-669.00R.
Sollberger, Urs: *See*—
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Solvay & Cie: *See*—
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Sommer, Gerd R.: *See*—
Gunter, Erwin J.; Sommer, Gerd R.; and Friedery, Albert L., 3,906,677.
Sone, Yoshiaki; and Ueno, Fumio, to Canon Kabushiki Kaisha. Film searching apparatus. 3,907,415, Cl. 353-26.000.
Sonobe, Kiyomi, to Iwaki Co., Ltd. Variable metering pump. 3,906,842, Cl. 92-13.100.
Sony Corporation: *See*—
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Kawakami, Hirotake; Yokoyama, Yoshihiro; and Fukumoto, Tooru, 3,908,098.
Yano, Yoshiaki, 3,906,702.
Sosa, Hector M. Drilling alignment device for electric hand drills. 3,906,640, Cl. 33-263.000.
Spain, William H.; and Spector, George. Break away front truck bumper. 3,907,352, Cl. 293-76.000.
Spaulding, Robert A.: *See*—
Bednarczyk, Edward A.; Spaulding, Robert A.; and Trible, Clayton J., 3,906,915.
Spaziani, Fred F., to Orion Research Incorporated. Apparatus for mixing fluids on stream. 3,907,258, Cl. 259-4.000.
Spector, George: *See*—
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Richmond, Rex; Moriarity, Jack; and Spector, George, 3,907,410.
Spain, William H.; and Spector, George, 3,907,352.
Sperandio, Francis; and Guglieri, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Self-tightening sealing arrangement for an enclosure such as a casing for an electrochemical cell. 3,907,602, Cl. 136-133.000.
Sperry Rand Corporation: *See*—
Miller, Harry, 3,906,792.
Spevack, Jerome S., to Deuterium Corporation. System for enrichment by dual temperature exchange. 3,907,500, Cl. 423-563.000.
Spevack, Jerome S., to Deuterium Corporation. Apparatus for concentrating by dual temperature exchange. 3,907,508, Cl. 23-270.500.
Spevack, Jerome S., to Deuterium Corporation. Countercurrent contact apparatus for deuterium concentration. 3,907,509, Cl. 23-270.500.
Spies, George R., Jr., to Airco, Inc. Condensate collection means. 3,907,263, Cl. 266-34.00R.
Spieth, Rudolf. Anti-friction bearing. 3,907,387, Cl. 308-236.000.
Spinner, Georg. HF coaxial plug connector. 3,907,399, Cl. 339-177.00R.
Spinnerhawk Company: *See*—
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Spivack, John D.: *See*—
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SPOFA, United Pharmaceutical Works: *See*—
Budesinsky, Zdenek; Janata, Vladimir; Svab, Alois; Bruna, Ladislav; Capek, Alois; and Simek, Antonin, 3,907,797.
Spooner, Robert J., to Cashin Systems Corporation. Apparatus for stacking and weighing sliced food products. 3,906,823, Cl. 83-73.000.
Sprague Electric Company: *See*—
Ross, Sidney D.; Dunkl, Franz S.; and Hutchins, Clinton E., 3,908,157.
Spreckelmeyer, Bernhard, to Bayer Aktiengesellschaft. Production of synthetic fluorspar. 3,907,978, Cl. 423-490.000.
Spry, Douglas O., to Eli Lilly and Company. Tricyclic cephalosporins. 3,907,785, Cl. 260-243.00C.
Stamicarbon, B.V.: *See*—
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Standard Oil Company, The: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Friedrich, Maria, 3,907,713.
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 3,907,859.
Kennedy, Alice W.; Shank, Raymond S.; and Wardlow, Eddie, Jr., 3,907,932.
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Milberger, Ernest C.; Dolhyj, Serge R.; and Hardman, Harley F., 3,907,834.
Standard Products Co., The: *See*—
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Stanley Works, The: *See*—
Clark, Robert P.; Haven, Robert Lee; and Kneidl, Franz A., 3,906,851.
Stansell, Stanley M., to Xerox Corporation. Ink applicator. 3,906,896, Cl. 118-637.000.
Stanton, Benjiman D.; and Goolsby, Alvin D., to Shell Oil Company. Method for blending multiple component streams using loss-in-weight boiling point analysis. 3,907,388, Cl. 208-354.000.
Stanwick, Glenn W. Interfering thread form. 3,907,017, Cl. 151-22.000.
Staples, Brewster H.: *See*—
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Staples, Crawford E., to Westinghouse Air Brake Company. Check-in, check-out track circuit arrangement. 3,907,237, Cl. 246-34.00A.
Staples, Richard M., to United States of America, Navy. Heat source for curing underwater adhesives. 3,906,926, Cl. 126-263.000.
Stapp, Willis J.; Crowe, Norman P.; and Molitor, Edwin A., to Multifold-International, Inc. Stacking and bundling machine. 3,907,129, Cl. 214-6.00C.
Starks, Charles M., to Continental Oil Company. Two-stage hydropyrolysis-cracking process for producing ethylene. 3,907,920, Cl. 260-683.00R.
Stauffer Chemical Company: *See*—
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Stautzenberger, Adin Lee, to Celanese Corporation. Absorbing SO_2 with polyacrylic acid solution. 3,907,972, Cl. 423-243.000.
Stawsky, Alfred: *See*—
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Stearns, Gabriel E., to Boeing Company, The; and Aeritalia S.p.A. Variable ramp exhaust nozzle and clamshell reverser. 3,907,224, Cl. 244-110.00B.
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Steele, James K., to Dynamic Air Inc. Switches for conveyor tubes. 3,907,374, Cl. 302-28.000.
Steffen, Vincent B. Grain bin safety device. 3,907,065, Cl. 182-95.000.
Steiman, Wolf, to VCA Corporation. Dispensing pump construction with foldable discharge nozzle. 3,907,174, Cl. 222-383.000.
Steimann, Roland: *See*—
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Steinmetz, Eberhard; and Berve, Jurgen, to Fried. Krupp Huttenwerke AG. Process for the production of steels having high chromium content and lowest possible carbon content. 3,907,548, Cl. 75-51.000.
Steinmetz, Hans-Joachim: *See*—
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Steltz, Irvin J.: *See*—
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Stepputat, Jurgen; Jung, Gerhard; and Wunderlich, Hermann, to Bayer Aktiengesellschaft. Process for purifying anthraquinone. 3,907,836, Cl. 260-369.000.
Sterling Drug Inc.: *See*—
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Lesher, George Y.; and Carabateas, Philip M., 3,907,808.
Sterling-Winthrop Research Institute: *See*—
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Stich, Walter, to Linde Aktiengesellschaft. Container for storing and transporting small gas volumes. 3,907,164, Cl. 222-3.000.
Stichting Waterbouwkiendig Laboratorium: *See*—
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Stigen, Merritt L., to Minnesota Mining and Manufacturing Company. Magnetic embossable label tape laminate. 3,908,065, Cl. 428-329.000.

Stock, Alvin L., to Westinghouse Electric Corporation. Bell seal vibration damper and seal improvement. 3,907,308, Cl. 277-72.00R.

Stoddard, Stanley Ward: *See—*
Fischer, Joseph Bernard; Ito, Roy Atsushi; Ross, Walter Lee; Schmidt, Maureen Randall; and Stoddard, Stanley Ward, 3,907,290.

Stoepel, Kurt: *See—*
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Stoever, Peter: *See—*
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Stokbroekx, Raymond Antoine: *See—*
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Janssen, Paul Adriaan Jan; Van Bever, Willem Florent Maria; and Stokbroekx, Raymond Antoine, 3,907,813.

Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunter, to Bayer Aktiengesellschaft. S-(amidocarbonyl)-methyl-O-alkylmonothiophosphoric acid ester amides. 3,907,938, Cl. 260-943.000.

Stone, Lowell D. Valve cleaner. 3,906,674, Cl. 51-12.000.

Stoody Company: *See—*
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Storck, Gerhard: *See—*
Marx, Matthias; and Storck, Gerhard, 3,907,737.

Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, to Warner-Lambert Company. Novel benzo(b)thiophene derivatives and processes for their preparation. 3,907,826, Cl. 260-330.500.

Streliszky, Janos: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andreas; Farkas, Lorant; Antus, Sandor; and Kovacs, Maria, 3,907,830.

Strickland, Bobby L.; and Simpson, Doyle E. Method of shampooing hair. 3,906,962, Cl. 132-7.000.

Strom, Johan Paul: *See—*
Ekenberg, Ulf Christer; Strom, Johan Paul; and Jonsson, Ragnar Georg, 3,907,467.

Strong, Clifford H. G., to Uniroyal Ltd. Process of extracting carrageenan from seaweed. 3,907,770, Cl. 260-209.00R.

Strow, Lawrence Evans: *See—*
Bolth, Franklin Anderson; Crozier, Ronald David; and Strow, Lawrence Evans, 3,907,854.

Struble, Glenn E., to Diamond International Corporation. Protective hood for carry-out food and foldable blank therefor. 3,907,195, Cl. 229-41.00B.

Struthers Scientific and International Corporation: *See—*
Ganiaris, Neophytos, 3,908,033.

Strutz, Carlon: *See—*
Manske, Warren C.; Bretl, Robert; and Strutz, Carlon, 3,906,579.

Stuchlik, John A. Corrosion resistant laminated pipe. 3,907,033, Cl. 166-228.000.

Stude, Duane L.; and Morris, Earl F., to Dow Chemical Company, The. Cement composition and method of cementing. 3,907,035, Cl. 166-293.000.

Studebaker, Thomas J., to Mohawk Data Sciences Corporation. Dome shaped switch member. 3,908,109, Cl. 200-275.000.

Studley Paper Company, Inc.: *See—*
Fesco, John E., 3,907,530.

Studtmann, George H., to Borg-Warner Corporation. Control system for adjusting a-c motor speed at line frequency or a subharmonic of the line frequency. 3,908,158, Cl. 318-227.000.

Stumpf, Joseph G.; and Andera, Joseph F., to Frigitronics of Conn., Inc. Cryogenic delivery line. 3,907,339, Cl. 285-149.000.

Stut, Hans; and Stiegler, Hans Leo, to Siemens Aktiengesellschaft. Method for the determination and/or control of dimensions of an object being supervised by an electronic camera. 3,908,077, Cl. 178-6.800.

Stutz, Hansruedi: *See—*
Eichenberger, Werner; Lapp, Karl; Loepfe, Erich; and Stutz, Hansruedi, 3,907,440.

Subsea Equipment Associates Limited: *See—*
Van Houten, Roland W.; and Engstrom, John W., 3,906,736.

Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,908,000.

Suda, Haruo; and Ishida, Fujio, to Citizen Watch Co., Ltd. Electronic alarm wristwatch. 3,906,713, Cl. 58-38.000.

Sudan, Jean Marie: *See—*
Didelot, Pierre; Lasserre, Guy; Letourneau, Georges; and Sudan, Jean Marie, 3,908,032.

Sugino, Hiromu: *See—*
Kakinuma, Atsushi; Kanamaru, Tsuneo; Sugino, Hiromu; Asano, Tsuneo; and Yoneda, Masahiko, 3,907,764.

Sulzer Brothers Limited: *See—*
Demuth, Hans, 3,907,005.
Pfarrwaller, Erwin, 3,907,006.

Suman, George O., Jr. Method of drilling and completing a well in an unconsolidated formation. 3,907,034, Cl. 166-250.000.

Sumitomo Chemical Company, Limited: *See—*
Yamamoto, Hisao; Okamoto, Tadashi; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; and Katayama, Shigenari, 3,907,812.
Yamazaki, Noboru; and Higashi, Fukuji, 3,907,855.

Sumitomo Electric Industries, Ltd.: *See—*
Nakamura, Kazunori; and Sibasaki, Hiromu, 3,906,711.

Sumitomo Metal Industries Ltd.: *See—*
Nire, Naomichi; and Sakai, Takeo, 3,907,648.

Summers, Stanley E.; and Dudzik, Werner M., to Black, Sivalls & Bryson, Inc. Reverse acting safety relief device. 3,906,977, Cl. 137-71.000.

Sun Oil Company: *See—*
Hollstein, Elmer J., 3,907,735.

Sun Oil Company of Pennsylvania: *See—*
Chang, Robert C. C., 3,907,606.

Sunbeam Corporation: *See—*
Du Bois, Jean-Pierre; and Stern, Ralph Charles, 3,908,111.

Sundstrand Corporation: *See—*
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Superior Electric Company, The: *See—*
Leenhouts, Albert C., 3,908,195.

Suresh, Dev D.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Friedrich, Maria, 3,907,713.
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 3,907,859.

Susuki, Rinnosuke; Hoshi, Hiroshi; and Umeya, Kaoru, to Lion Fat & Oil Co., Ltd. Luminescent color developing plate. 3,908,055, Cl. 428-67.000.

Sutherland, Glenn E.: *See—*
Micheli, Adolph L.; and Sutherland, Glenn E., 3,906,721.

Sutton, Blaine M.; and Weinstock, Joseph, to SmithKline Corporation. Anti-arthritic compositions comprising amide derivatives of pulvinic acid and methods of producing anti-arthritic activity. 3,907,997, Cl. 424-279.000.

Suzuki, Kanji; and Tada, Nagao, to Daishin Kogyo K.K. Toy gun. 3,906,662, Cl. 46-195.000.

Suzuki, Masao: *See—*
Aramaki, Kuninori; Kawakami, Hiroshi; and Suzuki, Masao, 3,907,685.

Suzuki, Seiichi, to Daisuzu Meriyasu Kogyo Kabushiki Kaisha. Hammer actuated clicker die press. 3,906,828, Cl. 83-539.000.

Suzuki, Toshihiro, to Central Glass Company, Limited. Apparatus for breaking off side margin of wire glass plate. 3,907,185, Cl. 225-97.000.

Suzuki, Yoshihisa: *See—*
Miyazaki, Tsutomu; Kato, Takashi; Suzuki, Yoshihisa; Yoshizawa, Toshio; and Ueda, Shozo, 3,906,712.

Suzuki, Yukio: *See—*
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Suzumura, Takashi: *See—*
Kakizaki, Kimio; and Suzumura, Takashi, 3,906,604.

Svab, Alois: *See—*
Budesinsky, Zdenek; Janata, Vladimir; Svab, Alois; Bruna, Ladislav; Capek, Alois; and Simek, Antonin, 3,907,797.

Svalberg, Erik Arnold: *See—*
Svalberg, Hans Erik; and Svalberg, Erik Arnold, 3,907,064.

Svalberg, Hans Erik; and Svalberg, Erik Arnold. Extendable escape ladder. 3,907,064, Cl. 182-70.000.

Svoboda, Petr: *See—*
Capka, Martin; Svoboda, Petr; Hetflejs, Jiri; Bazant, Vladimir; Bazant, Petr; Bazantova, Vera; and Bazant, Jan, 3,907,850.

Swaim, Frank H. Disabling mechanism for a combination lock. 3,906,761, Cl. 70-333.00R.

Swanson, Kenneth P., to Progressive Engineering, Inc. Weighting device for spinning frame drafting system. 3,906,590, Cl. 19-267.000.

Swanson, Roger M.: *See—*
Jordan, William E.; Barton, Edward B.; Fiske, Kenton W.; and Swanson, Roger M., 3,907,421.

Swart, Walter, to De Rotterdamsche Droogdok Maatschappij B.V. Pipe penetration structure for a nuclear reactor. 3,907,636, Cl. 176-87.000.

Sweat, Donald E.: *See—*
Hirono, Yosuke; and Sweat, Donald E., 3,906,900.

Swift & Company: *See—*
Schroeder, Larry A., 3,908,020.

Swiss Aluminium Limited: *See—*
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Sy, Max-Heinz: *See—*
Holdt, Bernd-Dieter; and Sy, Max-Heinz, 3,907,539.

Sydnor, Garland S., Sr. Feeding apparatus for physically handicapped persons. 3,907,126, Cl. 214-1.00T.

Symons, Philip C., to Energy Development Associates. Halogen hydrates. 3,907,592, Cl. 136-6.00R.

Symons, Philip C.; and Bjorkman, Harry K., to Energy Development Associates. Manufacture of chlorine hydrate. 3,908,001, Cl. 423-472.000.

Szlaga, Emil, Jr., to Colt Industries Operating Corporation. Carburetor with feedback means and system. 3,906,910, Cl. 123-119.00R.

T. Williams (Drop Forging & Tools) Limited: *See—*
Hastings, Basil Joseph, 3,906,628.

Tada, Nagao: *See—*
Suzuki, Kanji; and Tada, Nagao, 3,906,662.

Taguchi, Koichi: *See—*
Okada, Naotake; Tsubaki, Kazumi; Morinaga, Hiroshi; Iwabuchi, Takeshi; Iida, Masaru; and Taguchi, Koichi, 3,907,759.

Taiheiyo Coal Mining Co., Ltd.: *See—*
Nakajima, Shigeo, 3,907,367.

Takada, Juichiro, heir: *See*—
Takada, Takezo, deceased, 3,907,227.

Takada, Juichiro, legal representative: *See*—
Takada, Takezo, deceased; and Takada, Juichiro, legal representative, 3,907,059.

Takada, Takezo, deceased; and by Takada, Juichiro, legal representative, to Takata Kojyo Co., Ltd. Passive motion arresting protective device of shoulder arm type. 3,907,059, Cl. 180-82.00C.

Takada, Takezo, deceased (by Takada, Juichiro, heir), to Takata Kojyo Co., Ltd. Safety belt retractor. 3,907,227, Cl. 242-107.400.

Takahashi, Asao: *See*—
Sato, Mikio; Fujiwara, Hiroshi; and Takahashi, Asao, 3,907,828.

Takahashi, Kihei; and Akashi, Shunji, to Yoshida Kogyo Kabushiki Kaisha. Top stops for slide fasteners. 3,906,594, Cl. 24-205.11F.

Takahashi, Mayumi: *See*—
Uzuki, Teruo; Takahashi, Mayumi; Noda, Misa; Komachiya, Yoshioki; and Wakamatsu, Hachiro, 3,907,638.

Takahashi, Toshihiko: *See*—
Nagumo, Michihiko; Yamaguchi, Shigehiro; and Takahashi, Toshihiko, 3,907,553.

Takahashi, Yasuro; Fujima, Yukihisa; and Yamamoto, Hisao, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of burning fuels by means of a burner. 3,907,488, Cl. 431-2.000.

Takaki, Minoru: *See*—
Burton, Bernard Lee; Takaki, Minoru; and Hall, Roger D., 3,907,565.

Takasu, Masao: *See*—
Sando, Yoshikazu; Tsuchihashi, Takashi; Takasu, Masao; and Ishidoshiro, Hiroshi, 3,906,755.

Takata Kojyo Co., Ltd.: *See*—
Takada, Takezo, deceased; and Takada, Juichiro, legal representative, 3,907,059.
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Takatsu, Toshiharu: *See*—
Tanaka, Shigeo; Hashimoto, Kazuyoshi; Takatsu, Toshiharu; Abe, Mitsuhiro; Sada, Hidetaki; and Kawanami, Katsusuke, 3,906,767.

Takeda Chemical Industries, Ltd.: *See*—
Fujino, Masahiko; Wakimasu, Mitsuhiro; Nakajima, Nobuo; and Aoki, Hisashi, 3,907,766.
Kakinuma, Atsushi; Kanamaru, Tsuneo; Sugino, Hiromu; Asano, Tsuneo; and Yoneda, Masahiko, 3,907,764.
Kimura, Hiroshi; Kusakabe, Kensuke; Sato, Shigehiko; and Nakatani, Hiromi, 3,908,027.
Meguro, Kanji; and Kuwada, Yutaka, 3,907,820.

Takeda, Emiko, legal representative: *See*—
Shimojima, Yukiji; Mizuno, Yukiko; Horiguchi, Sadayuki; Mizuno, Masayuki; Ohoka, Tadaaki; and Takeda, Isao, deceased, 3,907,989.

Takeda, Isao, deceased: *See*—
Shimojima, Yukiji; Mizuno, Yukiko; Horiguchi, Sadayuki; Mizuno, Masayuki; Ohoka, Tadaaki; and Takeda, Isao, deceased, 3,907,989.

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Sakano, Tomiaki; and Takeda, Naoji, 3,906,622.

Takei, Haruo: *See*—
Shiba, Keisuke; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, 3,907,575.

Takemoto, Go: *See*—
Kawanaka, Hideo; Katabe, Kenichi; Kameda, Seizi; and Takemoto, Go, 3,908,048.

Tamai, Yasuo; Miyatuka, Hajime; and Honjo, Satoru, to Rank Xerox, Ltd. Liquid developer for electrophotography. 3,907,693, Cl. 252-62.100.

Tanahashi, Ryoji, to Nippon Gakki Seizo Kabushiki Kaisha. Edge members for ski. 3,907,314, Cl. 280-11.13E.

Tanaka, Atuio: *See*—
Goto, Michio; Ito, Shogo; and Tanaka, Atuio, 3,907,743.

Tanaka, Hosaku. Device for discharging refund coins and crushing metallic cans of different sizes. 3,907,087, Cl. 194-4.00C.

Tanaka, Shigeo; Hashimoto, Kazuyoshi; Takatsu, Toshiharu; Abe, Mitsuhiro; Sada, Hidetaki; and Kawanami, Katsusuke, to Mitsubishi Jukogyo Kabushiki Kaisha. Hydraulic roll-gap control system. 3,906,767, Cl. 72-21.000.

Tanaka, Yasuhisa; Shimamoto, Noboru; and Yokokawa, Kiyoshi, to Shinetsu Chemical Company. Silicone molding compositions. 3,907,742, Cl. 260-37.0SB.

Tanaka, Yoshitake: *See*—
Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,907,637.
Nakayama, Kiyoshi; Kohata, Mamoru; Tanaka, Yoshitake; Nomura, Tadaaki; and Katsumata, Ryoichi, 3,907,641.

Tandon, Jai Prakash: *See*—
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Tateno, Hidenori; Konishi, Masami; Arai, Hisaharu; and Koeda, Kenji, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Automatic choke for a carburetor. 3,907,943, Cl. 261-39.00B.

Taub Family Trust U/A: *See*—
Taub, Ronald H., 3,907,104.

Taub, Ronald H., to Taub Family Trust U/A. Combination shipping case and shelf extender display assembly. 3,907,104, Cl. 206-45.230.

Taylor, Brian W.: *See*—
Kobylinski, Thaddeus P.; and Taylor, Brian W., 3,907,835.
Kobylinski, Thaddeus P.; and Taylor, Brian W., 3,907,968.

Taylor, Herman, Jr.: *See*—
Murphy, Harry C., Jr.; Plundo, Robert A.; Stauffer, Harry C.; Taylor, Herman, Jr.; and Yanik, Stephen J., 3,907,667.

TDK Electronics Co., Ltd.: *See*—
Sato, Takateru; Shiba, Haruo; and Sekine, Masaoki, 3,907,234.

Technical Equipment Company of Gastonia, Inc.: *See*—
Dellinger, Larry Dean, 3,906,597.

Technion Research and Development Foundation, Ltd.: *See*—
Manor, Gedalyahu, 3,907,041.

TED Bildplatten Aktiengesellschaft: *See*—
Paul, Bruno; Wilisch, Jurgen; Wimmer, Gunter; and Richter, Volker, 3,907,305.

Tedball, Carole Anne, to Dow Chemical Company, The. Precipitation of sodium benzoate. 3,907,877, Cl. 260-515.00R.

Tedeschi, Edward T., Jr., to B. F. Goodrich Company, The. Shipside oil barrier seal. 3,906,732, Cl. 61-1.00F.

Tegethoff, Helmut, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Tubular apparatus, in particular a steam generator. 3,907,031, Cl. 165-162.000.

Teijin Limited: *See*—
Goto, Michio; Ito, Shogo; and Tanaka, Atuio, 3,907,743.

Teldix GmbH: *See*—
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Teledyne, Inc.: *See*—
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Teledyne Sprague Engineering, a division of Teledyne, Inc.: *See*—
Carr, George J., 3,907,000.

Telesco Brophey Limited: *See*—
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Teller, Daniel M.; and Sellstedt, John H., to American Home Products Corporation. 7-(2-Thioxo-4-thiazolidinecarboxamido)cephalosporanic acids and the corresponding S-ethers. 3,907,787, Cl. 260-243.00C.

Ten Tru Inc.: *See*—
Jenkins, Richard A.; and Trueblood, Jennifer J., 3,906,963.

Ten Broeck, Theodore R.; and Downey, Raymond E., to Goodyear Tire & Rubber Company, The. Method of producing powdered polymers. 3,907,734, Cl. 260-23.70M.

Tenneco Chemicals, Inc.: *See*—
Ruland, Norman L.; and Walker, David G., 3,907,911.

Tenney, Horace M.: *See*—
Mertzweiller, Joseph K.; and Tenney, Horace M., 3,907,705.

Terekhov, Yuriy V. Device for the determination and the automatic real time computation of the parameters of man's stability of stance. 3,906,931, Cl. 128-2.00N.

Terry, Burton Alexander. Chassis for an assembly. 3,906,741, Cl. 62-262.000.

Tershansy, Ronald A.; Russin, Nicholas C.; and McFarlane, Finley E., to Eastman Kodak Company. Process and catalyst-inhibitor system for preparing synthetic linear polyester. 3,907,754, Cl. 260-75.00R.

Terui, Yukimasa: *See*—
Yamaguchi, Ikutoshi; Terui, Yukimasa; and Akiyoshi, Katsumi, 3,907,004.

Tescom Corporation: *See*—
Fleischhacker, Joseph F.; and Hruby, Thomas W., 3,906,982.

Tesk, John A.: *See*—
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Tex-Steel Corporation: *See*—
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Texaco Development Corporation: *See*—
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Texaco Inc.: *See*—
Biasotti, Joseph Brian; and Oberender, Frederick G., 3,907,516.
Macaluso, Anthony, Sr.; and Rigdon, Orville W., 3,907,909.
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,906,734.

Texas Instruments, Incorporated: *See*—
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Textron Inc.: *See*—
Linsalato, Oronzo L.; and Pesout, Edward, Jr., 3,907,037.
Moertel, George B., 3,906,595.

Thatcher, Arthur K. Sonic carburetor system. 3,907,940, Cl. 261-1.000.

Thebeau, Harold E.: *See*—
Remley, Charles G.; Thebeau, Harold E.; and Medley, Raymond W., 3,907,039.

Theissen, Robert J., to Mobil Oil Corporation. Higher halophenoxy benzoic acid esters. 3,907,866, Cl. 260-471.00R.

Therachemie Chemisch Therapeutische Gesellschaft m.b.H.: *See*—
Saygin, Ferdi, 3,907,494.

Thettu, Raghulinga R., to Xerox Corporation. Visco-elastic dampener mechanism for fuser assembly. 3,907,493, Cl. 432-60.000.

Thettu, Reghulinga R., to Xerox Corporation. Reusable nip measuring device and method. 3,906,800, Cl. 73-432.00R.

Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of pure 1-amino anthraquinone. 3,907,838, Cl. 260-378.000.

Thomas & Betts Corporation: *See*—
Bawa, Jaspal S., 3,906,561.

Thomas, DeWayne James, to Intertherm, Inc. Air conditioner adapted for through-floor installation. 3,906,740, Cl. 62-239.000.

Thomas, Edward E. Means for operating garment slide fastener. 3,907,181, Cl. 223-111.000.

Thomas, H. Ronald: *See*—
Fitzpatrick, John W.; Forgensi, Rudolph; Johnston, Robert G.; and Thomas, H. Ronald, 3,908,046.

Thomas, Truman A., III, to Electric Golf Carts, Inc. Electric golf bag carrier. 3,907,056, Cl. 180-19.00R.

Thompson, Charles T.; Kidd, Frank B.; and Diamond, Lawrence W., to American Coldset Corporation. Integral junk basket for drill bit. 3,907,047, Cl. 175-312.000.

Thompson, Chester C., Jr.; and Malone, Howard F., to Radiation Dynamics, Inc. Filament supply circuit for particle accelerator. 3,908,160, Cl. 321-15.000.

Thompson, Clifford T.; and Schwab, Dennis J., to United States of America, Navy. Remotely controlled underwater instrument system. 3,906,564, Cl. 9-8.00R.

Thompson, James A.: *See—*
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Neely, James S.; and Thompson, James A., 3,908,028.

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Thor Power Tool Company: *See—*
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Thun, Alfred. Velocipede tread crank. 3,906,811, Cl. 74-594.100.

Thundiyil, George J.: *See—*
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Tielrooy, Robert W.: *See—*
Russell, Edward J.; and Tielrooy, Robert W., 3,907,095.

Tillotson, Henry B.; and Kenkel, Robert A., to Toro Company, The. Lawn mower starting interlock. 3,906,921, Cl. 123-179.00K.

Tine, Sebastian David: *See—*
Rushforth, Calvin; and Tine, Sebastian David, 3,906,987.

Ting-Man Wong, Daniel: *See—*
Marvel, Carl S.; Ting-Man Wong, Daniel; Westerman, Ira John; Samyn, Celeste; and Sivaramakrishnan, Parameswar, 3,907,748.

Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. 3-(Tetrahydro-2-pyranyl)-1,3,5-triazinediones and their use as herbicides. 3,907,795, Cl. 260-249.500.

Todora, Louis John: *See—*
Gerding, Charles Christian; and Todora, Louis John, 3,907,163.

Todorovic, Mile S. Outer wall insulation system. 3,906,693, Cl. 52-404.000.

Toko, Inc.: *See—*
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Toll, Gunnar Georg: *See—*
Jonsson, Bo Ragnar; Toll, Gunnar Georg; and Bodelind, Bo Torsten Krister, 3,907,534.

Tomelleri, Giordano. Artichoke treating machine. 3,907,101, Cl. 198-266.000.

Tomita, Mamoru: *See—*
Nagasawa, Taro; and Tomita, Mamoru, 3,907,777.

Tomita, Tutomu: *See—*
Matumoto, Noboru; Nonoyama, Takao; Tomita, Tutomu; and Suzuki, Yukio, 3,906,723.

Tomiyama, Shinichi. Biologically disintegrable resin molding comprising carboxymethyl cellulose and inorganic filler. 3,907,726, Cl. 260-17.00R.

Tomooka, Hajime: *See—*
Isa, Hiroshi; Tomooka, Hajime; Murakami, Yoshihiko; Karube, Kenji; Inomiya, Takeshi; and Nagayama, Masuzo, 3,907,924.

Tomozawa, Akihiro: *See—*
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Tong, Shih Yung, to Bell Telephone Laboratories, Incorporated. Frequency shift demodulator having a variable clock rate. 3,908,169, Cl. 325-320.000.

Toray Industries, Inc.: *See—*
Okazaki, Kaoru; Higuchi, Akira; and Imaeda, Naoki, 3,908,060.

Toro Company, The: *See—*
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Toyo Kogyo Co., Ltd.: *See—*
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Toyoda Koki Kabushiki Kaisha: *See—*
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Toyoda, Yasuhiro: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Tateno, Hidenori; Konishi, Masami; Arai, Hisaharu; and Koeda, Kenji, 3,907,943.
Yoshizaki, Masaaki, 3,906,724.

Trammell, Earl M., Jr., to Cycle-Drive Corporation. Bicycle drive assembly. 3,906,807, Cl. 74-143.000.

Traunecker, Werner: *See—*
Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, 3,907,775.

Treiber, Fritz F., to Hobart Corporation. Manual labelling apparatus. 3,907,627, Cl. 156-538.000.

Triangle Engineering, Inc.: *See—*
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Trible, Clayton J.: *See—*
Bednarczyk, Edward A.; Spaulding, Robert A.; and Trible, Clayton J., 3,906,915.

Trico Products Corporation: *See—*
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Trusty, Von Aldo. Power operated lawn edger. 3,907,040, Cl. 172-15.000.

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Tschink, Werner; and Beger, Rudolf. Lighting attachment for photographic enlargers. 3,907,427, Cl. 355-67.000.

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Tupy, John. Method and apparatus for disassembling plastic pipe from plastic fittings without damaging the fitting. 3,906,612, Cl. 29-426.000.

Tur, Wladimir; and Wyler, Eugen, to Lovida AG. Method and apparatus for determination of skin type. 3,906,933, Cl. 128-2.00W.

Turner, Robert Bruce, to American Medical Electronics Corporation. Electronic time and temperature measuring system. 3,906,797, Cl. 73-362.0AR.

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Ullmann, Dietrich; and Grasshoff, Hans-Dieter, to Deutsche Texaco Aktiengesellschaft. Complex soap lubricating grease. 3,907,692, Cl. 252-18.000.
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National Aeronautics and Space Administration; administrator; with respect to an invention of:
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Wasagchemie GmbH: *See*—
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Wasson, Burton K.; and Williams, Haydn W. R., to Merck & Co., Inc. 3-Hydroxy-3-morpholino-loweralkyl-3,4-dihydro-2H-1,5-benzodioxepin products. 3,907,793, Cl. 260-247.70A.

Watanabe, Akira: *See*—
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Watts Regulator Company: *See*—
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Wazbinski, Theodore Thaddeus: *See*—
Soderquist, Frederick John; Wazbinski, Theodore Thaddeus; and Waldman, Nathan, 3,907,916.

Weakley, Martin L., to Nipak, Inc. Process for manufacture of substituted carbamyl halides. 3,907,886, Cl. 260-544.00C.

Weant, Charles M.; and Schwartz, Arthur, to Schwartz, Arthur. Stand-up wheelchair. 3,907,051, Cl. 180-6.200.

Weatherchem Corporation: *See*—
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Weatherhead, Albert J., III, to Weatherchem Corporation. Container end closure with metal plate. 3,907,156, Cl. 220-307.000.

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Webb, Robert D., to Sigmatron, Inc. Electroluminescent display and method for driving the same. 3,908,150, Cl. 315-167.000.

Webber, Philip S.; Franz, Maurice F.; and Moline, Kenneth R., to Caterpillar Tractor Company. Shift control mechanism for transmissions. 3,906,813, Cl. 74-473.00R.

Weber, Albert L., to Watkins, Lloyd, J., a part interest. Pivot joint adapter. 3,906,552, Cl. 3-30.000.

Weber, Eduard: *See*—
Klein, Heinrich; and Weber, Eduard, 3,907,029.

Weber, Klaus; Hell, August; and Schneider, Horst, to Agfa-Gevaert Aktiengesellschaft. Arrangement for identifying customer films and evaluating means therefor. 3,907,110, Cl. 206-459.000.

Weber-Knapp Company: *See*—
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Webster Electric Company, Inc.: *See*—
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Webster, George Samuel: *See*—
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Weckesser, Ernst: *See*—
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Wegmann, Jerome B., to McNeil Corporation. Pump seal. 3,906,845, Cl. 92-168.000.

Wei, Peter H. L., to American Home Products Corporation. 7-[2-(N-amino amidinothio)acetamido]cephalosporanic acids. 3,907,789, Cl. 260-243.00C.

Weidenbenner, William A.; and Steltz, Irvin J., to Amchem Products, Inc. Heat transfer composition tape. 3,908,064, Cl. 428-323.000.

Weijland, Bernard H., to U.S. Philips Corporation. Production of a three-layer diac with five-layer edge regions having middle region thinner at center than edge. 3,907,615, Cl. 148-188.000.

Weimer, Charles P., Jr., to International Paper Company. Carton for shotgun or the like. 3,907,108, Cl. 206-317.000.

Weinstein, Marvin J.; Luedemann, George M.; and Wagman, Gerald H., to Schering Corporation. Antibiotic 66-40. 3,907,771, Cl. 260-210.0AB.

Weinstock, Joseph: *See*—
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Weirich, Walter; and Rosenhovel, Karl Heinz, to Gewerkschaft Eisenhutte Westfalia. Control systems for use with mineral mining apparatus. 3,906,738, Cl. 61-45.00D.

Weiser, Hal, to Durham Industries, Inc. Animated toy doll. 3,906,661, Cl. 46-119.000.

Welch, Forrest D. Lifting attachment for a crane. 3,907,142, Cl. 214-763.000.

Wellcroft (Control Gear) Ltd.: *See*—
Wells, William Henry Sidney, 3,907,071.

Wells, William Henry Sidney, to Wellcroft (Control Gear) Ltd. Foolproof control system for trailer brakes with break-away safety. 3,907,071, Cl. 188-3.00R.

Welther, Robert S., to Tru Inc. Spacecraft for deploying objects into selected flight paths. 3,907,225, Cl. 244-158.000.

Welton, Donald E., to Du Pont de Nemours, E. I., and Company. Process for production of 1,12-dodecanedioic acid. 3,907,883, Cl. 260-537.00P.

Wember, Kurt: *See*—
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Wendt, Alan C., to United States Gypsum Company. Self-aligning joist hanger for structural steel framing. 3,907,445, Cl. 403-232.000.

Werman, Per Olof, to Klippan G.m.b.H. Hamburg. Inflatable air bag for motor vehicles for attenuating the impact effect of the passenger in case of accident. 3,907,328, Cl. 280-150.0AB.

Werner, Wilfred M., to Schwend, Fred N., a part interest. Game apparatus. 3,907,293, Cl. 273-85.00A.

Wessely, Eugene, to Gallay S.A. End closures for metal drums. 3,907,152, Cl. 220-66.000.

Westbrook, Carl M., to Weatherhead Company, The. Overload protector for torquemeter. 3,906,786, Cl. 73-136.00A.

Westerman, Ira John: *See*—
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Western Electric Company, Incorporated: *See*—
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Westfall, Paul J. Log positioners. 3,906,829, Cl. 83-723.000.

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Weston, David Frederick, to Imperial Chemical Industries Limited. Forceps. 3,906,957, Cl. 128-321.000.

Weston Instruments, Inc.: *See*—
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White, George Raymond: *See*—
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White, Stanley A., to Rockwell International Corporation. Digital Hilbert transformation system. 3,908,114, Cl. 235-152.000.

Whitman, Robert Henry; and Lento, Louis Leonard, Jr., to American Cyanamid Company. Catalyst for elimination of pollutants in auto-exhaust gas. 3,907,964, Cl. 423-213.200.

Whitt, James A., to General Electric Company. Lubricant composition. 3,907,690, Cl. 252-14.000.

Wiedemann, Wolfgang: *See*—
Platte, Friedrich; and Wiedemann, Wolfgang, 3,907,479.

Wiemer, Klaus C., to Texas Instruments, Incorporated. Method of forming doped dielectric layers utilizing reactive plasma deposition. 3,907,616, Cl. 148-188.000.

Wiesboeck, Robert A., to United States Steel Corporation. Method for the preparation of high purity, highly surface active $LiAsF_6$. 3,907,977, Cl. 423-464.000.

Wiggins, Ernest J.: *See*—
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Wilamowski, George. Geometrical measurement devices. 3,906,639, Cl. 33-191.000.

Wilcox, Milton E., to Motorola, Inc. Amplifier circuit suitable for amplifying differential input signals and providing a single ended output signal. 3,908,171, Cl. 330-14.000.

Wilde, Gunter: *See*—
Bohm, Eberhard; Reh, Lothar; Weckesser, Ernst; Wilde, Gunter; and Winkhaus, Gunter, 3,907,971.

Wiley, Paul Ronald, to Bell Telephone Laboratories, Incorporated. High frequency character receiver. 3,908,084, Cl. 178-69.50R.

Wilisch, Jurgen: *See—*
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Wilkins, Judd R.; Pearson, Albin O.; and Mills, Stacey M., to United States of America, General Counsel. Measurement of gas production of microorganisms. 3,907,646, Cl. 195-103.50R.

Willcox, Oswin Burr, to Du Pont de Nemours, E. I., and Company. Opalescent TiO_2-containing compositions. 3,907,581, Cl. 106-193.00J.

William H. Rorer, Inc.: *See—*
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Williams, Clyde M., to Mayfield, Reid K., a part interest. Fishing rod support. 3,906,653, Cl. 43-21.200.

Williams, Donald L.: *See—*
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Williams, Earl Evan. Irrigation system. 3,906,667, Cl. 47-38.000.

Williams, Earl P.: *See—*
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Williams, Haydn W. R.: *See—*
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Williams, Lloyd A.: *See—*
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Williams, Robert J. Cart for lidded cans. 3,907,117, Cl. 211-71.000.

Williams, Theodore M. Electric broiler. 3,906,849, Cl. 99-392.000.

Willis, Frederick Gordon, to Mars, Incorporated. Apparatus for retarding the closing of the hinged cover of a coin mechanism. 3,907,086, Cl. 194-1.00K.

Willis, James L., Jr.; and Grandio, Philip, Jr., to Mobil Oil Corporation. Isomerization of aromatic hydrocarbons. 3,907,914, Cl. 260-668.00A.

Wilson, Alexander John, to Girling Limited. Servo-boosters for vehicle braking systems. 3,906,836, Cl. 91-369.00B.

Wilson, Geoffrey R.: *See—*
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Wilson, Michael R., to Canadian Patents and Development Limited. Enteric disease vaccine. 3,907,987, Cl. 424-92.000.

Wimmer, Gunter: *See—*
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Wingbermuhle, Berthold, to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft. Torque-measuring coupling. 3,906,787, Cl. 73-136.00A.

Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. 1-Alkyl-2-(pyridylthiomethyl)-5-nitro-imidazoles and derivatives thereof as well as process for their manufacture. 3,907,816, Cl. 260-294.80G.

Winkhaus, Gunter: *See—*
Bohm, Eberhard; Reh, Lothar; Weckesser, Ernst; Wilde, Gunter; and Winkhaus, Gunter, 3,907,971.

Winkler, Lyle D. Resealable hermetic vial. 3,907,144, Cl. 215-32.000.

Winn, Russell Edward, to Exxon Research & Engineering Co. Apparatus for maneuvering on a submerged surface. 3,906,572, Cl. 15-1.700.

Winter, George R., III; and Boney, William G., to Universal Oil Products Company. Dehydrogenation process. 3,907,665, Cl. 208-146.000.

Winter, George R., III, to Universal Oil Products Company. Water injection in a dehydrogenation process. 3,907,921, Cl. 260-683.300.

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Wisconsin Alumni Research Foundation: *See—*
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Wise, Eugene H.; and Galt, Homer W., to R & G Sloane Manufacturing Company, Inc. Method of molding a value with rotatable member. 3,907,959, Cl. 264-242.000.

Wistreich, Hugo E.; Thundiyil, George J.; and Juhn, Hyunil, to B. Heller and Co. Ethanol vapor sterilization of natural spices and other foods. 3,908,031, Cl. 426-335.000.

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Witte, Donald H., to Fox Pool Corporation. Swimming pool modular construction. 3,906,688, Cl. 52-152.000.

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Wohlfarter, Alois, to Maschinenfabrik Andritz Aktiengesellschaft. Roller arrangement in presses for the removal of water from materials. 3,906,853, Cl. 100-118.000.

Wolf, Irving W.; and Carpenter, William E., to Ampex Corporation. Cassette rack. 3,907,116, Cl. 211-40.000.

Wolfner, Andreas: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andreas; Farkas, Lorant; Antus, Sandor; and Kovacs, Maria, 3,907,830.

Wolga, George J. Optical alignment device providing a virtual pivoting laser. 3,907,436, Cl. 356-153.000.

Wood Industries, Inc.: *See—*
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Wood, Robert David, to Rolls-Royce (1971) Limited. Combustion apparatus for gas turbine engines. 3,906,718, Cl. 60-39.650.

Wood, Virgil W.: *See—*
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Woodfill, William L., to Brunswick Corporation. Marine jet drive with power trim control and auxiliary rudder steering. 3,906,885, Cl. 115-12.00R.

Woods, Donna Kimes: *See—*
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Woods, John W.: *See—*
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Worthley, Warren William, to General Electric Company. Surface roughness measurement instrument. 3,908,079, Cl. 178-6.800.

Wrammerfors, Per, to Allmanna Svenska Elektriska Aktiebolaget. Extrusion press for hydrostatic extrusion with a billet-holding piston in the pressure chamber. 3,906,770, Cl. 72-60.000.

Wright, Allen C., to Fafco Incorporated. Solar heater control system and method. 3,906,928, Cl. 126-271.000.

Wu, Yao Hua; and Rayburn, James W., to Mead Johnson and Company. N-[(4-pyridyl-piperazino)-alkyl]-azaspiroalkanediones. 3,907,801, Cl. 260-268.0BC.

Wunderlich, Hermann: *See—*
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Wurtinger, Horst: *See—*
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Wurzbacher, Frank, to British Petroleum Company Limited, The. Flow meter. 3,906,793, Cl. 73-269.000.

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Eichorn, Roger H., deceased; and Lincoln First Bank of Rochester, executor, 3,908,125.
Fitzpatrick, John W.; Forgensi, Rudolph; Johnston, Robert G.; and Thomas, H. Ronald, 3,908,046.
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Yabutani, Kunihiro; and Kishikawa, Zitsuichi, to Nihon Nohyaku Co. Ltd. Miticidal composition. 3,907,995, Cl. 424-251.000.

Yagi, Toshio: *See—*
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Yamada, Tateo: *See—*
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Yamagishi, Hidehisa; Mizuno, Hirokuni; Kashiyama, Yoshitaka; and Toyoda, Yasuhiro, to Nippon Kokan Kabushiki Kaisha. Process of forming colorless chromate film on Al, Al-alloy or Al-coated steel. 3,907,610, Cl. 148-6.200.

Yamaguchi, Ikutoshi; Terui, Yukimasa; and Akiyoshi, Katsumi, to Bridgestone Tire Company Limited. Light and rigid fiber glass reinforced plastic composite pipes. 3,907,004, Cl. 138-132.000.

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Yamamoto, Hisao; Okamoto, Tadashi; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; and Katayama, Shigenari, to Sumitomo Chemical Company, Limited. Butyrophenone derivatives. 3,907,812, Cl. 260-293.770.

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Yamazaki, Noboru; and Higashi, Fukuji, to Sumitomo Chemical Company, Limited. Process for producing active esters of amino acids. 3,907,855, Cl. 260-455.00R.

Yanagisawa, Isao: *See*—
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Yano, Yoshiaki, to Sony Corporation. Method of packing. 3,906,702, Cl. 53-14.000.

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Yokoe, Masaaki: *See*—
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Yokoyama, Yoshihiro: *See*—
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Yoneda, Masahiko: *See*—
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Yonemori, Hayato, to Crown Zellerbach Corporation. Process of making polyolefin fibers. 3,907,633, Cl. 162-157.00R.

Yonezawa, Teruhiko; and Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. Photopolymerizable composition. 3,907,574, Cl. 96-115.00P.

Yoo, Jin Sun, to Atlantic Richfield Company. Oligomerization process. 3,907,923, Cl. 260-683.15D.

York, Raymond A., to Beloit Corporation. Apparatus for automatically removing finished article from injection mold. 3,907,483, Cl. 425-436.00R.

Yoshida, Dan: *See*—
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Yoshida Kogyo Kabushiki Kaisha: *See*—
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Yoshimine, Masao: *See*—
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Yoshizaki, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air cleaner assembly for an internal combustion engine having an exhaust gas purification system. 3,906,724, Cl. 60-305.000.

Yoshizawa, Toshio: *See*—
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Yost, Kenneth J., to Coate Burial Vault, Inc. Sewage treatment system including effluent evaporator. 3,907,679, Cl. 210-70.000.

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Zafiroglu, Dimitri P., to Du Pont de Nemours, E. I., and Company. Airlaydown apparatus for assembling fibers into webs. 3,906,588, Cl. 19-156.300.

Zaiser, Wolfgang; and Hainmuller, Sigurd, to Daimler-Benz Aktiengesellschaft. Controllable aggregate-drive for internal combustion engines, especially for motor vehicle internal combustion engines. 3,906,808, Cl. 74-230.17F.

Zamist, Sophie. Anatomically-contoured sanitary napkin. 3,906,952, Cl. 128-290.00R.

Zanardo, Giacinto, to Industrie A. Aznussi S.p.A. Apparatus for dispensing and mixing liquid substances in metered volumes. 3,907,167, Cl. 222-57.000.

Zane, James E.; and Foster, John B. Roof-top container. 3,907,184, Cl. 224-.

Zanoni, Carl A., to Zygo Corporation. Edge-sensing with a scanning laser beam. 3,907,439, Cl. 356-160.000.

Zapata Pipeline Technology, Inc.: *See*—
Hayes, T. Jarrell, Jr.; and Gruller, David L., 3,907,338.

Zbrojovka Brno, narodni podnik: *See*—
Bures, Jiri; and Fic, Vojtech, 3,907,613.

Zellweger Uster AG: *See*—
Forgo, Gabor; Meyer, Erwin; and Moser, Karl, 3,908,191.

Zenger, Dieter: *See*—
Schaller, Hans Achim; Reinhardt, Gunter; and Zenger, Dieter, 3,907,412.

Zerlaut, H. Walter. Knock down chair assembly. 3,907,362, Cl. 297-440.000.

Zetlin, Lev. Structural member of sheet material. 3,906,571, Cl. 14-17.000.

Zeytoonian, Nerses J. Inspection devices. 3,908,119, Cl. 240-4.200.

Ziegelmeyer, Harold R. Pusher lugs for conveyors. 3,907,097, Cl. 198-173.000.

Ziegenhain, William C.; and Smith, John H., to Continental Oil Company. Method for producing high-porosity high-surface area, low-bulk density alumina. 3,907,512, Cl. 23-293.00A.

Zimmer, William F., Jr.: *See*—
Marshall, Charles W.; Henderson, Loran A.; and Zimmer, William F., Jr., 3,906,684.

Zimmerman, Thomas H., to United States of America, Army. Buckling protective fuze cap. 3,906,862, Cl. 102-81.000.

Zin-Plas Corporation: *See*—
Nelson, Merritt J., 3,906,990.

Zipcor, Inc.: *See*—
Coles, Donald K., 3,907,434.

Zurit, David; and Sciara, Frank, to Vending Components, Inc. Check valve for beer distributing system. 3,906,986, Cl. 137-212.000.

Zwernemann, Ross, to Motorola, Inc. Manufacture of a high voltage Schottky barrier device. 3,907,617, Cl. 148-188.000.

Zygo Corporation: *See*—
Zanoni, Carl A., 3,907,439.

Zygraich, Nathan; and Lobmann, Michele, to Recherche et Industrie Therapeutiques. Live attenuated infectious bovine rhinotracheitis virus vaccines and preparation thereof. 3,907,986, Cl. 424-89.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF SEPTEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Automation Equipment, Inc.: *See*—
Swoager, Jon R., Re. 28,556.
Coulter Electronics, Inc.: *See*—
Hogg, Walter R., Re. 28,558.
Griffiths, Peter John: *See*—
Williams, John Gordon; and Griffiths, Peter John, Re. 28,557.

Hogg, Walter R., to Coulter Electronics, Inc. Self-cleaning aperture tube for coulter study apparatus. Re. 28,558, Cl. 324-71.0CP.
Swoager, Jon R., to Automation Equipment, Inc. Multi-purpose vehicle for use underground. Re. 28,556, Cl. 61-63.000.
Williams, John Gordon; and Griffiths, Peter John. Disc dispensing apparatus. Re. 28,557, Cl. 133-5.000.

LIST OF PLANT PATENTEES

Conklin, Henry A.: *See*—
Perry, Anthony, and Conklin. 3,788.
Jackson and Perkins Co.: *See*—
Kordes, Reimer. 3,789.
Warriner, William A. 3,791.
Kordes, Reimer, to Jackson and Perkins Co. Rose plant. 3,789, 9–23–75, Cl. 25.
Mikkelsen, James C., to Mikkelsens Inc. Begonia plant. 3,786, 9–23–75, Cl. 68.
Mikkelsens Inc.: *See*—
Mikkelsen, James C. 3,787.
Mikkelsen, James C. 3,786.
Perry, Anthony, to Henry A. Conklin. Rose plant. 3,788, 9–23–75, Cl. 20.
Warriner, William A., to Jackson and Perkins Co. Rose plant. 3,791, 9–23–75, Cl. 15.

LIST OF DESIGN PATENTEES

AB Gustavsbergs Fabriker: *See*—
Nordgren, Peter. 236,896.
Akazawa, Toshimasa, and K. Ohta, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 236,912, 9–23–75, Cl. D56—48.
American Hospital Supply Corp.: *See*—
McPhee, Charles J. 236,918.
McPhee, Charles J. 236,919.
Amerock Corp.: *See*—
Tegner, Raymond U. H. 236,863.
Tegner, Raymond U. H. 236,864.
Tegner, Raymond U. H. 236,865.
Tegner, Raymond U. H. 236,873.
Tegner, Raymond U. H. 236,875.
Tegner, Raymond U. H. 236,876.
Tegner, Raymond U. H. 236,877.
Barry, Robert C., to Cooper Industries, Inc. Display rack for merchandise. 236,866, 9–23–75, Cl. D6—130.
Beichle, Larry C. Sprayer unit. 236,893, 9–23–75, Cl. D23—18.
Bierbusse, James H., to Uniroyal, Inc. Pneumatic tire tread and buttress. 236,887, 9–23–75, Cl. D12—143.
Berger, Martin M., to Leg Lure, Inc. Display unit. 236,860, 9–23–75, Cl. D6—25.
Brosk, Doris. Apron. 236,858, 9–23–75, Cl. D2—227.
Carlson, Donald E., to Mark Controls Corp. Wall hydrant. 236,892, 9–23–75, Cl. D23—12.
Compagnie Generale des Etablissements Michelin: *See*—
Verdier, Henri. 236,888.
Conrad, Michael, D. Unger, and H. H. Werner, to Wilkhahn, Wilkening & Hahne. Lounge chair. 236,861, 9–23–75, Cl. D6—38.
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Barry, Robert C. 236,866.
Covert, Douglas C., to Xerox Corp. Induction educational board. 236,890, 9–23–75, Cl. D19—62.
Culbertson, Richard, to General Electric Co. Walkie talkie. 236,901, 9–23–75, Cl. D26—14.
Du Bois, Ralph LaR. Ornamental cover for bathtub spout. 236,895, 9–23–75, Cl. D23—32.
Emmer, Peter, to International Standard Electric Corp. Stereo cassette tape recorder cabinet. 236,899, 9–23–75, Cl. D26—14.
Flumm, Paul T., to Robertshaw Controls Co. Combined clock and timer. 236,882, 9–23–75, Cl. D10—40.
Flumm, Paul T., to Robertshaw Controls Co. Combined clock and timer. 236,883, 9–23–75, Cl. D10—40.
Frazier, Preston J., Jr., to Faroy, Inc. Candleholder. 236,908, 9–23–75, Cl. D48—2.
Faroy, Inc.: *See*—
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Froehlich, Walter E. Board puller. 236,872, 9–23–75, Cl. D8—89.
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Grosfillex, Raymond, to Grosfillex S.A.R.L. Chair. 236,862, 9–23–75, Cl. D6—78.
Grosfillex S.A.R.L.: *See*—
Grosfillex, Raymond. 236,862.
Hideshima, Masatoshi, to Kabushiki Kaisha Ricoh. Electrostatic copier. 236,915, 9–23–75, Cl. D61—1.
Holther, Grover P., Jr., to Racine Federated Inc. Electric motor power unit or similar article. 236,898, 9–23–75, Cl. D26—5.
Horholt, Anders J. Combination burner and reflector for camp stove or the like. 236,867, 9–23–75, Cl. D7—136.
Hunt, John F. Buoyant amusement device. 236,905, 9–23–75, Cl. D34—15.410.
Illinois Tool Works, Inc.: *See*—
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Emmer, Peter. 236,899.
Johns, Burton A., one-fourth interest each to, B. A. Johns, J. M. Loechner, J. K. Griff, and G. J. Griff. Pallet. 236,886, 9–23–75, Cl. D12—53.
Kabushiki Kaisha Ricoh: *See*—
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Lampinen, Wesley G. Wood holder. 236,871, 9–23–75, Cl. D7—212.
Larsen, Raymond B. Magnetic tape cartridge. 236,900, 9–23–75, Cl. D26—14.
Leco Corp.: *See*—
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Leg Lure, Inc.: *See*—
Berger, Martin M. 236,860.
Levy, Abraham. Folding screen. 236,870, 9–23–75, Cl. D6—139.
Lotter, Clyde E., to Leco Corp. Electronic balance. 236,884, 9–23–75, Cl. D10—87.
Louis, Gloria D.: *See*—
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Louis, Urban J., to Gloria D. Louis. Wine press. 236,921, 9–23–75, Cl. D94—2.
MacKay, F. Gordon.: *See*—
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Martindale, John R. Table decoration with wreath. 236,903, 9–23–75, Cl. D29—23.
Matsumoto, Nobuki, to Ricoh Co., Ltd. Movie camera. 236,914, 9–23–75, Cl. D61—1.
Matsushita Electric Industrial Co., Ltd.: *See*—
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McPhee, Charles J., to American Hospital Supply Corp. Medical liquid bottle. 236,918, 9–23–75, Cl. D83—14.
Melnick, Norman, to Magic Marker Corp. Combined writing

instrument and cap therefor. 236,917, 9–23–75, Cl. D74—17.
Minnesota Mining & Mfg. Co.: *See*—
Mitchell, Donald J. 236,881.
Mitchell, Donald J., to Minnesota Mining & Mfg. Co. Packaging container for film processing chemicals. 236,881, 9–23–75, Cl. D9—164.
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Nordgren, Peter, to AB Gustavsberg's Fabriker. Dry closet. 236,896, 9–23–75, Cl. D23—48.
Ohta, Kikuo: *See*—
Akazawa, Toshimasa, and Ohta. 236,912.
Okada, Tomoji, and T. Nakayama, to General Electric Co. Combined portable cassette tape recorder with FM/AM receiver. 236,902, 9–23–75, Cl. D26—14.
Oyler, Herbert J., deceased, by M. F. Oyler. Hamburger cooker. 236,910, 9–23–75, Cl. D55—1.
Oyler, Herbert J., deceased, by M. F. Oyler. Barbecue cooker. 236,911, 9–23–75, Cl. D55—1.
Oyler, Margaret Frances: *See*—
Oyler, Herbert J., and M. F. 236,911.
Quaker Oats Co., The: *See*—
Snyder, Paul D. 236,904.
Racine Federated Inc.: *See*—
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Rice, Ronald J. Faucet handle. 236,894, 9–23–75, Cl. D23—28.
Richilano, Vincent J., to Zephyr Industries, Inc. Outdoor light mounting fixture. 236,909, 9–23–75, Cl. D48—31.
Ricoh Co., Ltd.: *See*—
Matsumoto, Nobuki. 236,914.
Robertshaw Controls Co.: *See*—
Flumm, Paul T. 236,882.
Flumm, Paul T. 236,883.
Sargis, Albert. Combined hand mounted rear view mirror and reflector. 236,889, 9–23–75, Cl. D12—189.
Saslowsky, Morris, to Wesco Industries Corp. Yarn guard for stop motion. 236,907, 9–23–75, Cl. D47—5.
Seiwa Co., Ltd.: *See*—
Wada, Zenko. 236,859.
Sharp, Larry L., and E. J. Soltysik, to Illinois Tool Works Inc. Distributing post for telephone wiring back panels. 236,878, 9–23–75, Cl. D8—229.
Sheridan, David S., to National Catheter Corp. Catheter. 236,920, 9–23–75, Cl. D83—12.
Snyder, Paul D., to The Quaker Oats Co. Infant's gym toy. 236,904, 9–23–75, Cl. D34—15.
Siegel, Robert M., F. G. MacKay, and J. J. Hall, to Xerox Corp. Computer cabinet. 236,897, 9–23–75, Cl. D26—5.
Soltysik, Edmund J.: *See*—
Sharp, Larry L., and Soltysik. 236,878.
Sway, Boris. Dispensing container. 236,879, 9–23–75, Cl. D9—2.
Tegner, Raymond U. H., to Amerock Corp. Soap dish bracket. 236,863, 9–23–75, Cl. D6—90.
Tegner, Raymond U. H., to Amerock Corp. Towel bar. 236,864, 9–23–75, Cl. D6—99.
Tegner, Raymond U. H., to Amerock Corp. Towel ring base. 236,865, 9–23–75, Cl. D6—103.
Tegner, Raymond U. H., to Amerock Corp. Security guard. 236,873, 9–23–75, Cl. D8—131.
Tegner, Raymond U. H., to Amerock Corp. Door knocker ring. 236,875, 9–23–75, Cl. D8—177.
Tegner, Raymond U. H., to Amerock Corp. Door knocker plate. 236,876, 9–23–75, Cl. D8—177.
Tegner, Raymond U. H., to Amerock Corp. Escutcheon for a dead lock. 236,877, 9–23–75, Cl. D8—179.
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Van der Lely, Cornelis, and A. van der Lely. Cultivator tine. 236,906, 9–23–75, Cl. D40—1.
Verdier, Henri, to Compagnie Generale des Etablissements Michelin. Tire. 236,888, 9–23–75, Cl. D12—147.
Wada, Zenko, to Seiwa Co., Ltd. Neck-tie support. 236,859, 9–23–75, Cl. D2—359.
Wallace, Miles W. Proportional graduate. 236,885, 9–23–75, Cl. D10—101.
Weissenbourger, Kenneth A. Gun holster. 236,891, 9–23–75, Cl. D22—13.
Wesco Industries Corp.: *See*—
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Wolfe, Maynard F. Camera clip. 236,916, 9–23–75, Cl. D16—1.
Xerox Corp.: *See*—
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Siegel, Robert M., MacKay, and Hall. 236,897.
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 23, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

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104.1R	3,906,577
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157.3R	3,906,605
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	3,907,514
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100	3,906,655
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	3,906,657

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63	3,907,517
66	3,907,518

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19	3,906,659
65	3,906,660
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195	3,906,662

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163	3,906,679
	3,906,680
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170T	3,906,682
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87	3,906,687
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184	3,906,690
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318	3,906,692
404	3,906,693
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536	3,906,696
619	3,906,697
663	3,906,698
712	3,906,699
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42	3,906,703
48	3,906,704
252	3,906,705
331.5	3,906,706

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71	3,906,708

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71	3,907,522
73	3,907,523
88	3,907,524
122	3,907,525
223	3,907,526
233	3,907,527
276	3,907,528
337	3,907,529
377	3,907,530
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53	3,906,712

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115	3,906,714
125C	3,906,715

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CLASS 60

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39.65	3,906,718
225	3,906,719
256	3,906,720
276	3,906,721
289	3,906,722
290	3,906,723
305	3,906,724
307	3,906,725
327	3,906,726
403	3,906,727
524	3,906,728
600	3,906,729
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665	3,906,731

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45D	3,906,733
	3,906,738
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46.5	3,906,735
63	Re.28,556
69	3,906,736
72.5	3,906,737

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6	3,906,739
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262	3,906,741
332	3,906,742
374	3,906,743
384	3,906,744

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21	3,906,747

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2	3,907,532
17	3,907,533
30	3,907,534
33	3,907,535
60	3,907,536
142	3,907,537

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157	3,906,752
170	3,906,753
177	3,906,754

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154	3,906,760
333R	3,906,761
390	3,906,762
456R	3,906,763

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68	3,907,539
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88	3,907,542
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95	3,907,544
113	3,907,545

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9	3,906,765
12	3,906,766
21	3,906,767
22	3,906,768
46	3,906,769
60	3,906,770
122	3,906,771
251	3,906,772
380	3,906,773
391	3,906,774
	3,906,775
	3,906,776
447	3,906,777
459	3,906,778

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11	3,906,779
61R	3,906,780
84	3,906,781
94	3,906,782
	3,906,783
100	3,906,784
118	3,906,785
136A	3,906,786
	3,906,787
141A	3,906,788
146	3,906,789
170A	3,906,790
194A	3,906,791
213	3,906,792
269	3,906,793
300	3,906,794
309	3,906,795
362AR	3,906,796
	3,906,797
384	3,906,798
398C	3,906,799
432R	3,906,800
457	3,906,801
516LM	3,906,802
552	3,906,803

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10.54	3,906,805
143	3,906,807
217S	3,906,809
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395	3,906,810
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527	3,906,815
575	3,906,816
594.1	3,906,811
711	3,906,812
740	3,906,817
801	3,906,818

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60	3,907,549
65ZM	3,907,550
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73	3,906,823
81	3,906,824
155.1	3,906,825
267	3,906,826
299	3,906,827
539	3,906,828
723	3,906,829

CLASS 84

1.01	3,906,830
475	3,906,831

CLASS 85

26	3,906,832

CLASS 89

196	3,906,833

CLASS 90

11C	3,906,834

CLASS 91

308	3,906,835
369B	3,906,836
378	3,906,837
413	3,906,838
418	3,906,839
445	3,906,840
487	3,906,841

CLASS 92

13.1	3,906,842
168	3,906,845

CLASS 93

61B	3,906,844
61R	3,906,843

CLASS 96

1M	3,907,558
1.3	3,907,559
1.4	3,907,560
1.5	3,907,557
1.6	3,907,561
1.8	3,907,562
3	3,907,563
33	3,907,564
36.2	3,907,565
48R	3,907,566
49	3,907,567
60BF	3,907,568
90R	3,907,569
	3,907,570
100	3,907,571
	3,907,572
114	3,907,573
115P	3,907,574
124	3,907,575

CLASS 98

40D	3,906,846

CLASS 99

287	3,906,847
339	3,906,848
392	3,906,849
450.7	3,906,850

CLASS 100

4	3,906,851
98R	3,906,852
118	3,906,853

CLASS 101

93.34	3,906,854
223	3,906,855
349	3,906,856

CLASS 102

8	3,906,857
28R	3,906,858
41	3,906,859
56	3,906,860
76R	3,906,861
81	3,906,862

CLASS 104

88	3,906,863
	3,906,864
89	3,906,865
139	3,906,866
172S	3,906,867

CLASS 105

4R	3,906,868
164	3,906,869
464	3,906,870
475	3,906,871

CLASS 106

2	3,907,576
14	3,907,578
39.7	3,907,577
41	3,907,579
53	3,907,584
	3,907,585
54	3,907,586
158	3,907,580
193J	3,907,581
281R	3,907,582
307	3,907,583

CLASS 108

92	3,906,872

CLASS 110

7S	3,906,873
14	3,906,874

CLASS 111

2	3,906,875

CLASS 112

79A	3,906,876
141	3,906,877
423	3,906,878

CLASS 114

43.5	3,906,879
74R	3,906,880
144C	3,906,881
210	3,906,882

235B 3,906,883
3,906,884

CLASS 115

12R 3,906,885
16 3,906,886
18E 3,906,887
19 3,906,888

CLASS 118

5 3,906,889
6 3,906,890
12 3,906,891
49.1 3,906,892
63 3,906,893
315 3,906,894
326 3,906,895
637 3,906,896
3,906,897
3,906,898
3,906,899

CLASS 119

2 3,906,900
58 3,906,901
60 3,906,902
3,906,903

CLASS 122

32 3,906,904
3,906,905

CLASS 123

8.13 3,906,906
3,906,907
75CC 3,906,908
97B 3,906,909
119F 3,906,911
3,906,912
119R 3,906,910
121 3,906,913
122AA 3,906,914
127 3,906,915
139AP 3,906,916
146.5A 3,906,917
148E 3,906,918
3,906,919
3,906,920
179K 3,906,921
190B 3,906,922
193CP 3,906,923
193P 3,906,924

CLASS 126

110R 3,906,925
263 3,906,926
270 3,906,927
271 3,906,928

CLASS 128

1 3,906,929
2F 3,906,930
3,906,932
3,906,935
2M 3,906,938
2N 3,906,931
2R 3,906,934
3,906,936
2W 3,906,933
2.05C 3,906,937
2.05G 3,906,939
40 3,906,940
82 3,906,941
84C 3,906,942
90 3,906,943
133 3,906,944
191R 3,906,945
214.4 3,906,946
237 3,906,947
245 3,906,948
249 3,906,949
266 3,906,950
283 3,906,951
290R 3,906,952
303.1 3,906,953
303.17 3,906,955
305 3,906,954
305.3 3,906,956
321 3,906,957
349R 3,906,958
419PG 3,906,960
419P 3,906,959

CLASS 131

17R 3,907,321
135 3,906,961

CLASS 132

7 3,906,962
92A 3,906,963

CLASS 133

1A 3,906,964
3,906,965
5 Re.28,557

CLASS 134

32 3,907,587
46 3,906,966
104 3,906,967

CLASS 135

4R 3,906,968
5A 3,906,969
22 3,906,970
47 3,906,971

CLASS 136

6LF 3,907,590
6LN 3,907,591
6R 3,907,588
3,907,589
3,907,592
7 3,907,593
27 3,907,594
89 3,907,595
100R 3,907,596
3,907,597
107 3,907,598
111 3,907,599
121 3,907,600
131 3,907,601
133 3,907,602
140 3,907,603
146 3,907,604
177 3,907,605
233 3,907,606

CLASS 137

13 3,906,972
3,906,973
15 3,906,974
56 3,906,975
68 3,906,976
71 3,906,977
78 3,906,978
83 3,906,979
106 3,906,980
115 3,906,981
116.5 3,906,982
119 3,906,983
171 3,906,984
192 3,906,985
212 3,906,986
218 3,906,987
227 3,906,988
315 3,906,992
320 3,906,989
359 3,906,990
540 3,906,993
544 3,906,994
575 3,906,995
604 3,906,996
614.16 3,906,997
625.24 3,906,998
625.32 3,906,999
630.13 3,906,991

CLASS 138

30 3,907,000
31 3,907,001
115 3,907,002
118.1 3,907,003
132 3,907,004
155 3,907,049
157 3,907,050

CLASS 139

340 3,907,005
353 3,907,006

CLASS 140

93R 3,907,007
105 3,907,008

CLASS 141

27 3,907,009
45 3,907,010
92 3,907,011
349 3,907,012
392 3,907,013

CLASS 144

32 3,907,014
136J 3,907,015
172 3,907,016

CLASS 148

1.5 3,907,607
6.2 3,907,608
3,907,609
3,907,610
6.3 3,907,611
18 3,907,612
31.5 3,907,613
36 3,907,614
188 3,907,615
3,907,616
3,907,617
189 3,907,618

CLASS 149

2 3,907,619

CLASS 151

22 3,907,017

CLASS 152

310 3,907,018
330R 3,907,019

CLASS 156

11 3,907,620
18 3,907,621
58 3,907,622
77 3,907,623
214 3,907,624
253 3,907,625
361 3,907,626
538 3,907,627
574 3,907,628

CLASS 159

13A 3,907,629

CLASS 160

1 3,907,020
118 3,907,021

CLASS 162

13 3,907,630
42 3,907,631
66 3,907,632
157C 3,907,633
204 3,907,634
211 3,907,635

CLASS 164

82 3,907,022
3,907,023
212 3,907,024

CLASS 165

63 3,907,025
70 3,907,026
155 3,907,027
156 3,907,028
161 3,907,029
162 3,907,030
3,907,031
166 3,907,032

CLASS 166

228 3,907,033
250 3,907,034
293 3,907,035

CLASS 168

26 3,907,036

CLASS 169

57 3,907,037

CLASS 172

9 3,907,038
15 3,907,039
3,907,040
780 3,907,041

CLASS 173

160 3,907,042
163 3,907,043

CLASS 174

19 3,908,073
58 3,908,074
68.5 3,908,075

CLASS 175

16 3,907,044
45 3,907,045
235 3,907,046
312 3,907,047
325 3,907,048

CLASS 176

87 3,907,636

CLASS 178

6.6R 3,908,080
6.7A 3,908,076
6.8 3,908,077
3,908,078
3,908,079
3,908,081
7.2 3,908,082
7.5R 3,908,083
69.5R 3,908,084

CLASS 179

15G 3,908,085
2DP 3,908,086
15AF 3,908,087
15BC 3,908,088
15BT 3,908,090
16EA 3,908,091
18BC 3,908,089
18ES 3,908,092
37 3,908,093
81B 3,908,094
100.41Z 3,908,096
102 3,908,095
111R 3,908,098
156A 3,908,097
175.2R 3,908,099

CLASS 180

6.2 3,907,051
6.48 3,907,053
6.7 3,907,052
9.48 3,907,055
9.6 3,907,054
19R 3,907,056
64A 3,907,057
74 3,907,058
82C 3,907,059
114 3,907,060
117 3,907,061

CLASS 181

.5 3,907,062
169 3,907,063

CLASS 182

70 3,907,064
95 3,907,065
112 3,907,066
164 3,907,067
194 3,907,068

CLASS 184

6 3,907,069
6.13 3,907,070

CLASS 188

3R 3,907,071
32 3,907,072
71.2 3,907,073
72.9 3,907,074
73.3 3,907,081
77W 3,907,075
218XL 3,907,076
3,907,077
222.1 3,907,078
290 3,907,079
322 3,907,080

CLASS 192

12BA 3,907,082
41A 3,907,083
58B 3,907,084
91A 3,907,085

CLASS 194

1K 3,907,086
4C 3,907,087
9R 3,907,088

CLASS 195

29 3,907,637
3,907,638
36R 3,907,639
3,907,640
49 3,907,641
62 3,907,642
80R 3,907,643
99 3,907,644
103.5R 3,907,645
3,907,646
139 3,907,647

CLASS 197

1R 3,907,089
3,907,090
3,907,092
53 3,907,091
162 3,907,094

CLASS 198

10 3,907,093
25 3,907,095
30 3,907,096
173 3,907,097
218 3,907,098
220BC 3,907,099
3,907,100
266 3,907,101
285 3,907,102

CLASS 200

5EA 3,908,101
5A 3,908,100
19A 3,908,102
50B 3,908,103
50C 3,908,104
61.25 3,908,105
82B 3,908,106
84R 3,908,107
153LA 3,908,108
275 3,908,109

CLASS 201

6 3,907,648

CLASS 202

177 3,907,683

CLASS 204

15 3,907,649
34 3,907,650
70 3,907,651
79 3,907,652
94 3,907,653
98 3,907,654
158HA 3,907,655
159.16 3,907,656
195S 3,907,657
197 3,907,658
290F 3,907,659
298 3,907,660

CLASS 206

1.5 3,907,103
45.23 3,907,104
216 3,907,105
219 3,907,106
223 3,907,107
317 3,907,108
406 3,907,109
459 3,907,110
511 3,907,111

CLASS 208

48Q 3,907,661
53 3,907,662
70 3,907,663
80 3,907,664
146 3,907,665
191 3,907,666
210 3,907,667
216 3,907,668
341 3,907,669
354 3,907,388

CLASS 209

121 3,907,112
137 3,907,670
144 3,907,671

CLASS 210

7 3,907,672
17 3,907,673
20 3,907,674
23 3,907,675
31C 3,907,676
54 3,907,677
63 3,907,678
70 3,907,679
71 3,907,680
75 3,907,681
114 3,907,682
242 3,907,684
3,907,685
259 3,907,686
321 3,907,687
424 3,907,688

CLASS 211

19 3,907,113
20 3,907,114
34 3,907,115
40 3,907,116
49S 3,907,119
71 3,907,117
113 3,907,118

CLASS 212

26 3,907,120

CLASS 213

8 3,907,121
14 3,907,122

CLASS 214

1BB 3,907,123
1BC 3,907,124
1B 3,907,125
1T 3,907,126
6DS 3,907,127
6C 3,907,129
6D 3,907,128
10.5R 3,907,130
17DA 3,907,131
18R 3,907,132
44B 3,907,133
83.36 3,907,135
138R 3,907,136
147R 3,907,137
370 3,907,138
518 3,907,139
671 3,907,140
701P 3,907,141
763 3,907,142
768 3,907,143

CLASS 215

32 3,907,144
206 3,907,145
317 3,907,146

CLASS 219

121LM 3,908,110
442 3,908,111

CLASS 220

1.5 3,907,147
3,907,148
3 3,907,149
19 3,907,150
63R 3,907,151
66 3,907,152
85R 3,907,154
86R 3,907,153
210 3,907,155
307 3,907,156
327 3,907,157
352 3,907,158

CLASS 221

23 3,907,159
84 3,907,160
211 3,907,161

CLASS 222

1 3,907,162
3,907,163
3 3,907,164
16 3,907,165
42 3,907,166
57 3,907,167
76 3,907,168
95 3,907,169
135 3,907,170
182 3,907,171
189 3,907,172
330 3,907,173
383 3,907,174
402.13 3,907,175
402.22 3,907,176
500 3,907,177
504 3,907,178
513 3,907,179

CLASS 223

48 3,907,180
111 3,907,181

CLASS 224

2B 3,907,182
32 3,907,183
42.1R 3,907,184

CLASS 225

97 3,907,185

CLASS 226

7 3,907,186
42 3,907,187
154 3,907,188
176 3,907,189

CLASS 227

127 3,907,190

CLASS 228

118 3,906,617
3,906,618
182 3,907,191
256 3,907,192

CLASS 229

16 3,907,193
23BT 3,907,194
41B 3,907,195

CLASS 235

54D 3,907,196
61B 3,908,112
61.11E 3,907,197
61.7R 3,908,113
144DM 3,907,198
152 3,908,114
3,908,115
3,908,116
153AK 3,908,117
181 3,908,118

CLASS 237

12.3B 3,907,199

CLASS 238

7 3,907,200
84 3,907,201

CLASS 239

15 3,907,202
242 3,907,204
307 3,907,205
314 3,907,203
357 3,907,206
415 3,907,207
428.5 3,907,208
533 3,907,209
553.3 3,907,210
676 3,907,211
685 3,907,212

CLASS 240

4.2 3,908,119
51.11R 3,908,120

CLASS 241

40 3,907,213
79 3,907,214
88.4 3,907,215
152A 3,907,216

CLASS 242

18PW 3,907,217
46.2 3,907,232
47 3,907,233
55.19A 3,907,234
57 3,907,235
85.1 3,907,236
107.4 3,907,227
129 3,907,228
129.8 3,907,229
192 3,907,230

CLASS 243

2 3,907,231

CLASS 244

5 3,907,218
7A 3,907,219
54 3,907,220
58 3,907,221
74 3,907,222
77A 3,907,223
110B 3,907,224
158 3,907,225
169 3,907,226

CLASS 246

34A 3,907,237
34R 3,907,238

CLASS 248

229 3,907,239
254 3,907,240
346 3,907,241
3,907,242
441 3,907,243

CLASS 249

40 3,907,244
94 3,907,245
202 3,907,246
3,907,247

CLASS 250

199 3,908,121
259 3,908,122
298 3,908,123

311 3,908,124
316 3,908,125
320 3,908,126
325 3,908,127
366 3,908,128
577 3,908,129

CLASS 251

30 3,907,248
126 3,907,249
147 3,907,250
189 3,907,251

CLASS 252

8.7 3,907,689
14 3,907,690
18 3,907,691
3,907,692
62.1 3,907,693
3,907,694
3,907,695
73 3,907,696
75 3,907,697
99 3,907,698
149 3,907,699
300 3,907,700
344 3,907,701
370 3,907,702
373 3,907,703
392 3,907,704
430 3,907,705
431C 3,907,706
437 3,907,707
439 3,907,708
453 3,907,709
455R 3,907,710
455Z 3,907,711
456 3,907,712
462 3,907,713
3,907,714
465 3,907,715
471 3,907,716
508 3,907,717
522 3,907,718

CLASS 254

8B 3,907,252
29R 3,907,253
131 3,907,254
156 3,907,255
160 3,907,256

CLASS 259

4 3,907,258
192 3,907,259

CLASS 260

2EC 3,907,719
2.5AM 3,907,721
3,907,722
2.5F 3,907,723
2.5R 3,907,720
7 3,907,724
17R 3,907,725
3,907,726
3,907,727
17.2 3,907,728
3,907,729
17.4SG 3,907,730
18PF 3,907,731
22XA 3,907,732
22D 3,907,733
23.7M 3,907,734
28.5A 3,907,735
29.4R 3,907,736
29.6NR 3,907,737
29.6R 3,907,738
30.8R 3,907,739
33.4R 3,907,740
33.6UA 3,907,741
37SB 3,907,742
45.75C 3,907,743
45.85R 3,907,749
45.9AA 3,907,745
45.9R 3,907,744
45.95R 3,907,746
46.5R 3,907,747
3,907,750
47CP 3,907,752
47UA 3,907,751
49 3,907,748
67.5 3,907,753
75R 3,907,754
78A 3,907,755
78.4E 3,907,756
79.3MU 3,907,758
79.3R 3,907,757
88.2R 3,907,760
3,907,761
88.2 3,907,759
112.5 3,907,762
3,907,764
3,907,765
3,907,766
112.7 3,907,763
140 3,907,767
143 3,907,768
156 3,907,769
209R 3,907,770
210AB 3,907,771
210R 3,907,772
3,907,774
210.5 3,907,773
3,907,775
3,907,776
211.3 3,907,777
211.5R 3,907,778
3,907,779
239A 3,907,780
239.3A 3,907,781
240H 3,907,783
240J 3,907,782
243C 3,907,784
3,907,785
3,907,786
3,907,787
3,907,788
3,907,789
244 3,907,790
246B 3,907,791
247.2B 3,907,792
247.7A 3,907,793
247.7E 3,907,823
248A 3,907,794
249.5 3,907,795
3,907,796
251R 3,907,797
256.4F 3,907,798
3,907,799
256.5R 3,907,800
268BC 3,907,801
268SY 3,907,802
270 3,907,803
279R 3,907,804
3,907,805
284 3,907,806
287R 3,907,807
3,907,808
288CE 3,907,809
293.7 3,907,810
293.77 3,907,811
3,907,812
293.79 3,907,813
294.8E 3,907,814
294.8G 3,907,816
294.8K 3,907,815
295H 3,907,817
299 3,907,818
302R 3,907,819
308R 3,907,820
3,907,821
309.2 3,907,822
310R 3,907,824
311 3,907,825
330.5 3,907,826
340.5 3,907,827
3,908,027
343.9 3,907,828
3,907,829
345.2 3,907,830
3,907,831
345.7 3,907,832
346.8 3,907,833
3,907,834
3,907,835
369 3,907,836
376 3,907,837
378 3,907,838
396N 3,907,840
396R 3,907,839
3,907,841
397.1 3,907,842
397.2 3,907,843
397.5 3,907,844
3,907,845
408 3,907,846
429R 3,907,847
429.5 3,907,848
438.5R 3,907,849
448.2B 3,907,851
448.2E 3,907,850
448.2N 3,907,852
455A 3,907,854
455R 3,907,855
456R 3,907,853
457 3,907,856
462R 3,907,857
465D 3,907,862
465F 3,907,861
465.3 3,907,859
3,907,860
465.5A 3,907,858
468K 3,907,863
471C 3,907,864
3,907,865
471R 3,907,866
473G 3,907,867
475D 3,907,868
482R 3,907,869
485J 3,907,870
488J 3,907,872
488R 3,907,871
489 3,907,873
497R 3,907,874
501.19 3,907,875
513R 3,907,876
515R 3,907,877
3,907,878
518R 3,907,879
3,907,880
524R 3,907,881
533A 3,907,882
537P 3,907,883
542 3,907,884
543F 3,907,885
544C 3,907,886
552SC 3,907,887
553A 3,907,888
559AT 3,907,889
3,907,890
561N 3,907,891
562B 3,907,892
562R 3,907,893
566R 3,907,894
567.6M 3,907,895
586C 3,907,896
599 3,907,897
606.5P 3,907,898
609D 3,907,899
609R 3,907,900
610B 3,907,901
3,907,902
610R 3,907,903
613R 3,907,904
3,907,905
615BF 3,907,907
615R 3,907,906
617F 3,907,908
632HF 3,907,909
650R 3,907,910
655 3,907,911
659A 3,907,912
666P 3,907,913
668A 3,907,914
668R 3,907,915
669R 3,907,916
680E 3,907,918
680R 3,907,917
3,907,919
683R 3,907,920
683.15B 3,907,922
683.15D 3,907,923
3,907,924
683.3 3,907,921
791 3,907,925
860 3,907,926
875 3,907,927
876B 3,907,929
3,907,930
3,907,931
876R 3,907,928
881 3,907,932
887 3,907,933
895 3,907,935
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PATENTS

1 : 3,907,056	3,906,831	3,907,477	3,908,109	3,906,559	3,906,840
3,907,303	3,906,859	3,907,510	9 : 3,906,557	3,906,590	3,906,866
3,907,352	3,906,861	3,907,515	3,906,618	3,906,640	3,906,882
3,907,417	3,906,913	3,907,519	3,906,647	3,906,849	3,906,941
3,907,498	3,906,914	3,907,523	3,906,795	3,906,884	3,906,958
3,907,963	3,906,917	3,907,557	3,906,823	3,906,900	3,906,976
2 : 3,906,643	3,906,919	3,907,565	3,906,851	3,906,937	3,906,980
3,907,581	3,906,920	3,907,590	3,906,874	3,906,939	3,907,012
4 : 3,906,792	3,906,926	3,907,659	3,906,988	3,906,942	3,907,054
3,906,809	3,906,928	3,907,691	3,907,044	3,907,146	3,907,055
3,906,979	3,906,977	3,907,697	3,907,069	3,907,184	3,907,058
3,907,021	3,907,000	3,907,699	3,907,092	3,907,204	3,907,066
3,907,162	3,907,010	3,907,714	3,907,108	3,907,253	3,907,070
3,907,228	3,907,014	3,907,783	3,907,174	3,907,272	3,907,102
3,907,287	3,907,015	3,907,790	3,907,176	3,907,289	3,907,104
3,907,404	3,907,023	3,907,799	3,907,271	3,907,334	3,907,141
3,907,487	3,907,028	3,907,815	3,907,339	3,907,463	3,907,144
3,907,617	3,907,037	3,907,867	3,907,353	3,907,680	3,907,154
3,907,748	3,907,062	3,907,907	3,907,384	3,907,940	3,907,158
3,908,153	3,907,079	3,907,913	3,907,386	3,908,074	3,907,172
3,908,162	3,907,099	3,907,947	3,907,395	3,908,115	3,907,177
3,908,171	3,907,103	3,907,959	3,907,409	13 : 3,906,654	3,907,205
5 : 3,906,754	3,907,116	3,907,973	3,907,439	3,906,665	3,907,214
3,907,207	3,907,134	3,907,981	3,907,441	3,906,777	3,907,257
3,907,946	3,907,169	3,907,993	3,907,455	3,907,053	3,907,294
6 : 3,906,554	3,907,181	3,908,002	3,907,476	3,907,119	3,907,310
3,906,565	3,907,221	3,908,006	3,907,670	3,907,182	3,907,342
3,906,573	3,907,225	3,908,029	3,907,674	3,907,300	3,907,344
3,906,619	3,907,226	3,908,061	3,907,677	3,907,520	3,907,360
3,906,630	3,907,233	3,908,076	3,907,716	3,907,977	3,907,362
3,906,634	3,907,235	3,908,080	3,907,740	3,908,112	3,907,370
3,906,635	3,907,244	3,908,091	3,907,890	15 : 3,907,672	3,907,371
3,906,637	3,907,263	3,908,114	3,907,960	16 : 3,906,737	3,907,382
3,906,658	3,907,286	3,908,118	3,907,964	3,907,728	3,907,383
3,906,669	3,907,290	3,908,129	3,907,994	17 : 3,906,548	3,907,408
3,906,690	3,907,293	3,908,148	3,908,012	3,906,550	3,907,445
3,906,694	3,907,298	3,908,150	3,908,067	3,906,567	3,907,483
3,906,719	3,907,324	3,908,168	3,908,068	3,906,593	3,907,485
3,906,720	3,907,332	3,908,170	3,908,100	3,906,605	3,907,505
3,906,725	3,907,337	3,908,173	3,908,110	3,906,609	3,907,511
3,906,736	3,907,341	3,908,183	3,908,180	3,906,613	3,907,555
3,906,744	3,907,345	3,908,193	3,908,195	3,906,614	3,907,589
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3,906,758	3,907,354	3,906,649	3,906,753	3,906,704	3,907,605
3,906,763	3,907,389	3,906,875	3,907,735	3,906,729	3,907,634
3,906,783	3,907,401	3,906,934	3,907,795	3,906,740	3,907,665
3,906,804	3,907,419	3,907,309	3,907,805	3,906,813	3,907,669
3,906,814	3,907,430	3,907,502	3,907,819	3,906,819	3,907,681
3,906,820	3,907,442	3,907,620	3,907,926	3,906,830	3,907,763
3,906,821	3,907,444	3,907,647	3,907,933	3,906,835	3,907,809
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PLANT PATENTS

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U. S. GOVERNMENT PRINTING OFFICE : O - 1975

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